

# OPERATION

# Bus Stop Census

## 2020 Census Report and Findings

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In partnership with:





Photo credit: Adam Shumaker

# Dedication

Operation Bus Stop Census 2020 Final Report is dedicated in loving memory of Jeffrey Parker, former MARTA General Manager and CEO who unexpectedly and tragically passed on Friday, January 14, 2022. Parker was a passionate transit advocate, husband, and father who actively supported MARTA Army's efforts in creating a better experience for all riders. Parker served as MARTA CEO from 2018 up until his passing. We are grateful for Parker's leadership as he built the foundation for a new future of MARTA in the metro Atlanta region fighting for state funding and expansion of service into Gwinnett and Clayton County. He deeply cared for his staff, Board of Directors and community, and will be missed.

Thank you Jeffrey Parker for your dedication and service.

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# Executive Summary



**Bus stops are gateways to opportunity, connecting people to jobs, healthcare, family, groceries, entertainment, recreation, and more. They are a pivotal part of the [Metropolitan Atlanta Rapid Transit Authority's \(MARTA\)](#) current bus network, serving as an origin or destination to over 44 million boardings in 2020. The humble bus stop is a contributor to the social, economic, and environmental vitality of our communities, but they do not get the attention they deserve.**

Many bus stops in metropolitan Atlanta lack adequate sidewalks, accessible nearby marked crosswalks (within 100 feet for the purposes of this report), lighting, trash cans, and shelter from the natural elements. Dangerous and poorly designed bus stops are barriers to opportunities and social connections. Without connecting sidewalks and curb cuts, people with disabilities cannot reach bus stops. Without shelters or benches, older riders cannot comfortably wait for buses, particularly during hot Atlanta summers or wet winter days. Every day, bus riders, especially people of color and low-income riders, must endure bus stops that are unsafe, inaccessible, and undignified.

MARTA Army acknowledged these issues in its Fall 2019 Book Club on Steven Higashide's *Better Buses, Better Cities: How to Plan, Run, and Win the Fight for Effective Transit*. The conclusion drawn

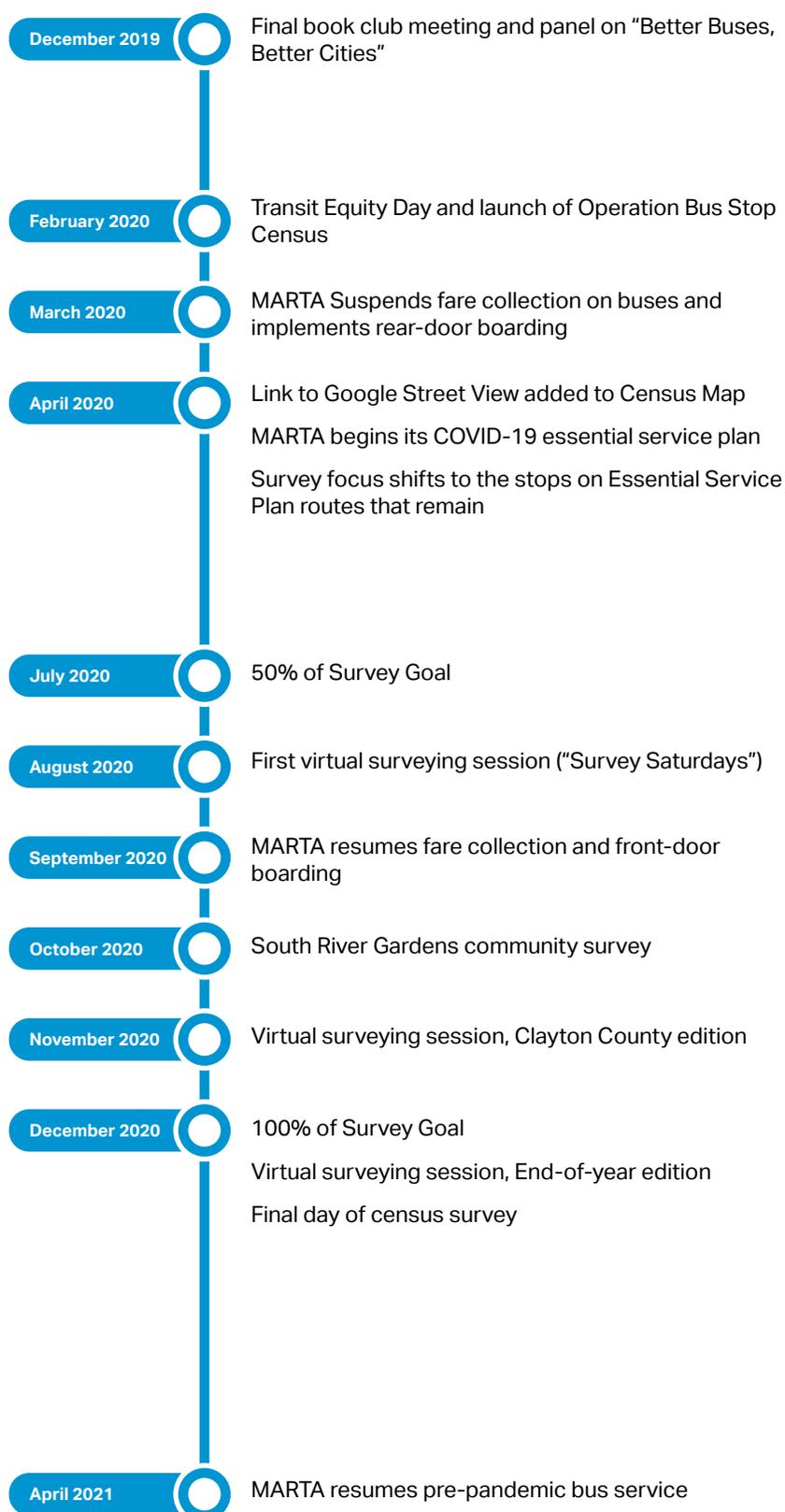
from this book club was 1) there is a knowledge gap on the condition and amenity level of bus stops and 2) that knowledge gap must be filled so that agencies, local jurisdictions and advocates can identify, prioritize, and implement improvements. Thus, MARTA Army and its partners launched Operation Bus Stop Census to fill the gap.

Operation Bus Stop Census is a crowdsourcing initiative whose purpose is to collect data on bus stop amenities, pedestrian facilities, and rider behavior. The operation launched in February 2020 with the goal of collecting information on 2,500 bus stops in the MARTA service area. The data collected would provide key stakeholders, such as MARTA, local government, and community organizations, a clear picture of the condition of bus stops and the information needed to identify and prioritize opportunities for improvement.

# Data Collection

Since its launch, Operation Bus Stop Census accomplished the collection of data on available amenities at over 3,200 bus stops (approximately one-third of all MARTA bus stops) with the help of over 300 volunteer surveyors. The data collection phase lasted nearly one year and was conducted both in-person and remotely via Google Street View. Through the bus stop census, MARTA Army obtained a good sample of bus stop conditions in the MARTA system, including a comprehensive snapshot of at least 85% of bus stops along twelve bus routes. Figure 1 displays a timeline of Operation Bus Stop Census.

**Figure 1 | Operation Bus Stop Census Timeline.**



# The Findings

**Bus stop accessibility emerged as a top issue from the census data. The Bus Stop Census found that 25% of surveyed bus stops, accounting for 11% of the average weekly ridership, lack any paved sidewalk while many others had obstructed sidewalks. The Bus Stop Census also found 58% of the surveyed bus stops, contributing to 44% of the average weekly ridership, lacked nearby crosswalks on the main street. Crossing infrastructure such as curb cuts and tactile guide strips were missing from 45% and 60% of surveyed bus stops, respectively.**

There is an opportunity to add seating and shelters at more bus stops. Seating and shelters were present at 19% and 12% of bus stops surveyed and contributed to 41% and 36% of the average weekly ridership, respectively. A sizable number of riders already benefit from seating and/or shelters at a small number of bus stops, where the ridership exceeds the threshold for a bench or shelter installation.

Accessible wayfinding was also lacking at many bus stops. The Bus Stop Census found that only 13% of bus stops surveyed had some wayfinding information available, and even fewer had route maps, route schedules, route numbers, or customer service information. The 13% of bus stops surveyed with some wayfinding information accounted for 40% of the average weekly ridership. In addition, the Bus Stop Census determined wayfinding information provided

in shelters to be inaccessible because the signs do not meet [Americans with Disabilities Act \(ADA\)](#) requirements: the sign's mounted height to font size ratio does not meet section 703.5.5 Visual Character Height guidelines and the color contrast of the sign does not meet 703.5.1 Finish and Contrast guidelines regarding a non glare finish, making the signs difficult to read.

Other elements of the bus stop experience, such as rider and motorist behavior, were collected as well. 32% of submitted surveys reported dangerous motorist behavior around the bus stop. 14% of survey responses reported riders crossing the street mid-block where there is no marked crosswalk. And finally, 12% of submitted surveys reported riders traveling to the bus stop using informal pathways where a sidewalk does not exist.

**Using the data collected from the Bus Stop Census, MARTA Army compiled metropolitan Atlanta's first ever Bus Stop Report Card.**

**The stops surveyed received an overall grade of 71%, or a C-.**

The Bus Stop Report Card is explained in [Section 5](#) of the report.

# Recommendations

**MARTA Army recommends key stakeholders take action to improve bus stops through three channels: planning and design, data collection and sharing, and community engagement. The recommendations from this report were developed by analyzing data collected from the Bus Stop Census, researching best practices from other metropolitan areas, and speaking with stakeholders about challenges to providing safe, accessible, and dignified bus stops.**



## Planning and Design

The most effective path to improved bus stops is through early intervention during planning and design. For transit agencies such as MARTA and the [Atlanta-Region Transit Link Authority](#) ("the ATL," which coordinates regional transit), this means adopting universal design standards to make bus stops accessible by the greatest extent of users.

It means addressing issues under its control such as wayfinding information availability and accessibility.

For local jurisdictions, it means planning for the installation and maintenance of safe and accessible sidewalks and crosswalks near bus stops, with lighting, traffic signals or other safe crossing measures where appropriate.

In addition, developers and property owners should be required to coordinate with MARTA and the relevant [DOT](#) for all projects impacting bus stops, ensuring bus stop planning and design is baked into the development cycle versus being an afterthought.



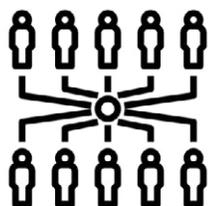
## Data Collection and Sharing

Clear processes for agencies and communities to continue collecting and sharing bus stop data should be established, so that the public has a dedicated, visible means to submit new requests and observe the progress on bus stop improvements.

As a low-tech supplement, MARTA and community/advocacy organizations should conduct regular listening sessions throughout the MARTA bus network to collect feedback from riders on how their bus stop needs may be met.

MARTA and local governments should look ahead to how future data standards on bus stop amenities could make bus stop details easier to share, especially with ADA routing applications.

## Recommendations, continued:



### Community Engagement

Communities need to be empowered to take action not only to understand their bus stops but also to improve them for their members. Adopt-A-Stop programs provide an outlet for local riders and residents to take ownership of bus stops in their community for a small incentive. It also provides transit agencies and local jurisdictions with a way to stay abreast of issues before they become major problems while reducing the maintenance load on staff.

Residents should be trained to navigate the bus stop planning, design, installation, and maintenance process through leadership academies hosted by MARTA and/or advocacy organizations. Such training gives residents the tools needed to take action when their community is experiencing problems with their bus stops.

Finally, leaders and residents must be well-resourced and educated on all things bus stops. They should become knowledgeable about the history of the bus network; the process of bus stop planning, design, and maintenance; performing community bus stop audits; designing safe crossings; requesting shelters; and more. With this knowledge, communities can make better decisions to maintain and improve their bus stops in a way that best meets their needs.

# Recommendation Matrix

The Recommendation Matrix provides a summary of each recommendation contained in this report, the entity responsible for its implementation, and the estimated timeline to implement.

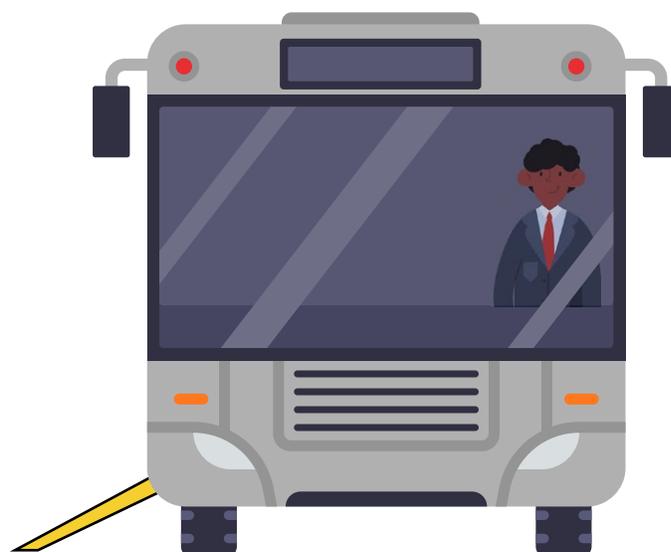
Recommendation	Responsible Entity	Est. Implementation Time frame
<b>Planning and Design</b>		
Update route information at shelters	MARTA	within 6 months
Adopt universal design guidelines	MARTA, ATL, metropolitan Atlanta transit agencies	6-12 months
Add wayfinding signage to bus stop markers	MARTA	6-12 months
Improve wayfinding accessibility at shelters	MARTA	6-12 months
Require coordination between MARTA and developers in zoning and development code	Local and State Jurisdictions with input from MARTA	6-12 months
Balance bus stops	MARTA, Local and State Jurisdictions	12 months and beyond
Build and maintain safe and accessible sidewalks and safe road crossings near bus stops	Local and State Jurisdictions	12 months and beyond
<b>Data Collection and Sharing</b>		
Conduct bus stop listening sessions	MARTA in partnership with Community and Advocacy Organizations	within 6 months
Promote standardized, open data formats for accessibility and bus stop amenities	MARTA, ATL, Community and Advocacy Organizations	6-12 months
Implement MARTA311 system	MARTA, ATL	12 months and beyond
<b>Community Engagement</b>		
Enhance and expand Adopt-A-Stop Programs	MARTA	within 6 months
Host Resident Leader Academies for bus stop advocacy	MARTA, Community and Advocacy Organizations	6-12 months
Get educated on bus stops	Everyone	Today!

# Conclusion

**The findings from the Bus Stop Census are indicative of metropolitan Atlanta's struggle to provide safe, accessible, and dignified bus stops to as many of its residents as possible. Personal anecdotes collected from bus riders during the Bus Stop Census exemplify how this struggle has failed to meet the diverse set of needs of a diverse group of riders.**

The deficiencies reported are *not* solely the responsibility of any one entity. MARTA, state and local jurisdictions, neighborhood associations, religious organizations, community organizations, and individuals have all contributed to the forsaking of bus stops through the prioritization of auto-centric projects, the devaluation of the voices of bus riders, and the inability to think big in small ways. In a region where promises for mobility have fallen short, now is time to master the basics and regain trust.

Refocusing planning and design efforts to prioritize the needs of bus riders, implementing innovative data sharing and collection practices to collect feedback and monitor bus stop conditions, and empowering communities to take action to understand and improve their bus stops are our recommendations to regain trust and provide safe, accessible, and dignified bus stops.



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# Introduction



**If you've ever traveled on a Metropolitan Atlanta Rapid Transit Authority (MARTA) bus, it's likely your ride started or ended at a bus stop. These humble launch pads serve a remarkable purpose; bus stops are gateways to opportunity, connecting people to work, childcare, grocery stores, medical appointments, sports games, concerts, family and friends, and so much more. Bus stops unlock a low-cost alternative to car ownership and help people get around without breaking the bank. Buses and trains also play a role in reducing metropolitan Atlanta's production of greenhouse gases. Bus stops are already hard at work in metropolitan Atlanta's transit network, vital to the 44 million trips taken by MARTA bus in 2020 at the start of the pandemic (comprising 49% of annual boardings on bus, rail, and MARTA mobility combined).<sup>1</sup>**

Considering just how important bus stops are to the social, economic, and environmental vitality of our communities, they do not get the attention they deserve. Indeed, many bus stops in metropolitan Atlanta lack adequate sidewalks, accessible nearby crosswalks (within 100 feet), lighting, trash cans, and even shelter from the natural elements. Dangerous and poorly designed bus stops are barriers to opportunities and social connections. Without connecting sidewalks or curb cuts, people with disabilities cannot reach bus stops. Without shelters or benches, older riders and others cannot comfortably wait for buses, particularly during hot Atlanta summers or wet winter days. Every day, bus riders, especially people of color and low-income riders, must endure bus stops that are unsafe, inaccessible, and undignified. A history of limited funding for transit constricting its expansion and operation, federal and local policies encouraging suburban sprawl and car-centric development, and structural racism producing gaps in opportunity for people of color has contributed to the inequitable conditions of bus stops in the metropolitan Atlanta area.

MARTA bus stops were a focus of MARTA Army's Fall 2019 Book Club discussing Steven Higashide's *Better Buses, Better Cities: How to Plan, Run, and Win the Fight for Effective Transit*. The participants of the book club were familiar with the unsatisfactory conditions of bus stops in metropolitan Atlanta. However, a gap existed in understanding the specific problems faced by riders, where these problems were occurring, how many riders were impacted, and how to begin solving them.

In order to overcome the knowledge gap, MARTA Army followed TransitCenter's first advice in making great bus stops: "Be an expert on your bus stops."<sup>2</sup> This entails identifying the locations of stops, documenting their conditions, and capturing information on bus stop amenities. With over 9,000 stops in the MARTA service area, it truly takes an army to conduct these tasks... a MARTA Army. MARTA Army began tackling this challenge under the name of Operation Bus Stop Census.

# Operation Bus Stop Census

Operation Bus Stop Census launched on February 4, 2020, which marks Transit Equity Day. On that day, MARTA Army hosted a public forum at MARTA's Five Points Station alongside our partners: Atlanta Bicycle Coalition, Georgia Stand-Up, Partnership for Southern Equity (PSE), iAccess Life, Sierra Club of Georgia, TransFormation Alliance, and PEDS, as seen in Figure 2. Transit Equity Day is an annual celebration of national efforts that highlight the call for more equitable transit. It is also the birthday of Civil Rights activist Rosa Parks, who refused to give up her seat on a segregated Montgomery, Alabama bus in 1955.

Inspired by the U.S. Census taking place during the same year, Operation Bus Stop Census relied on crowdsourcing specific information about bus stops, such as the presence of sidewalks or the material of the boarding area. Crowdsourcing allowed MARTA Army to extend its reach and capture input from everyday people interested in the state of their local bus stops. The data collected would be made available to the public so advocates, neighborhood organizations, and other stakeholders could understand the bus stops in their communities and identify improvements. The data would also be shared with key decision makers, such as MARTA and local government officials, to better inform their efforts at improving the condition of bus stops for their riders or constituents.

**Figure 2** | Transit Equity Day 2020 Public Forum.



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# Overview of the Report

This report describes the efforts of Operation Bus Stop Census, shares the results, and makes recommendations to MARTA, local jurisdictions, and community organizations on how to begin building a foundation for safe, accessible, and dignified bus stops. The report is divided up into six main sections:

**[Section 1](#)** provides background to the MARTA bus network and jurisdictional responsibilities.

**[Section 2](#)** describes the survey design, composition, and administration.

**[Section 3](#)** gives an overview of the quality control and quality assurance procedures used to clean and validate the survey responses.

**[Section 4](#)** summarizes key findings from the survey responses.

**[Section 5](#)** shares MARTA Army's Bus Stop Report Card and the overall letter grade for all bus stops surveyed.

**[Section 6](#)** lists MARTA Army's recommendations to planning and design, data collection and sharing, and community engagement.

Bus stops that do not meet the needs of the riders are barriers to opportunity and connection for our friends, family, and neighbors. The Atlanta metropolitan region has an opportunity to take action to remove these barriers and create bus stops that truly serve the needs of riders. As metropolitan Atlanta faces surmounting pressure to increase and improve transit options in response to growing populations, equity concerns, and climate change, prioritizing bus stops is a simple, cost-effective, yet crucial step in overcoming the barriers to social, economic, and environmental flourishing in our communities.

SECTION 1

# MARTA's bus network and jurisdictional responsibilities



# Overview of the MARTA Bus System

## Scope of the MARTA Bus System

MARTA is the ninth largest transit system in the U.S. and operates, as of August 2021, 113 bus routes covering the City of Atlanta and Fulton, DeKalb, and Clayton counties of Georgia. MARTA's 2020 fiscal year budget was approximately \$1.1 billion, with 45% for operations and 55% for capital programs.<sup>3</sup> The main funding source for both MARTA bus and rail is a sales tax in each jurisdiction (1% in counties and 1.5% in City of Atlanta), adopted by local referendum. Farebox revenue covered about 27% of operating expenses in 2019.<sup>4</sup> A regular one-way MARTA bus and rail fare costs \$2.50 and includes four onward transfers within three hours of initial payment by Breeze Card (which is MARTA's contactless regional fare card). Older citizens, people with disabilities, and Medicare recipients pay \$1 when using a special Breeze Card that displays the beneficiary's photo.

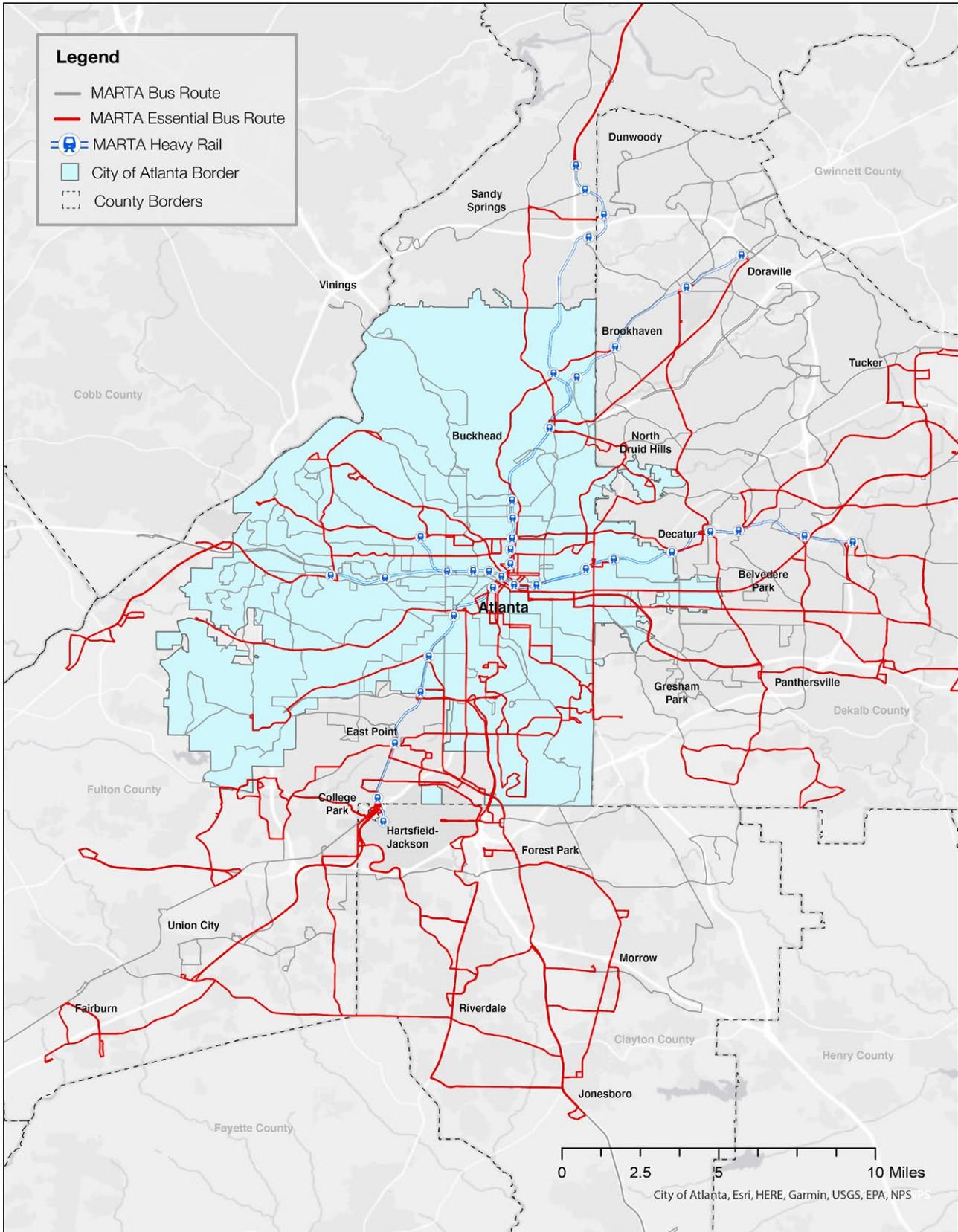
To date, bus service is organized as a feeder system, with routes radiating from MARTA's rail stations (Figure 3). Bus routes generally don't cross the quadrants formed by the MARTA rail system. Basic bus service operates 7 days a week, with buses every 30-40 minutes, typically, from morning to midnight. The

busiest routes have buses every 10 minutes during peak times. MARTA has a fleet of 538 low-floor, ADA-accessible buses, including 448 buses deployed in peak hours (in 2019),<sup>5</sup> operated by 1,479 operators.<sup>6</sup>

In addition to bus stops, MARTA Mobility paratransit provides curb-to-curb service, scheduled up to 7 days in advance, to anyone unable to ride or disembark from regularly scheduled MARTA transit buses and trains. Although most MARTA Mobility trips are curb-to-curb or door-to-door, MARTA Mobility may, in some instances, simply pick up a customer at a designated location and transport them to the nearest appropriate, accessible fixed route bus stop or rail station.

Inaccessible bus stops that many people with disabilities would otherwise use, require MARTA Mobility operators to make lengthier, sometimes unnecessary trips that could serve other passengers instead. MARTA Mobility operates during the same days and hours as the fixed route bus and rail services. The paratransit fare is \$4.00 for all passengers, reflecting the higher cost to provide the service compared to regular bus routes. MARTA contracts out its Mobility service, reflecting the higher cost to provide the service compared to regular bus routes. MARTA contracts out its Mobility service.

**Figure 3 | Map of MARTA's bus network as of April 2019 with Essential Service Plan routes outlined in red**



## Impact of COVID-19 on the MARTA Bus Network

Beginning March 2020, the COVID-19 state of emergency in the United States led many people to stay home or work remotely and dramatically reduced the consumption of goods and services. Non-essential travel was discouraged to help contain the number of COVID-19 cases. MARTA made a number of operational adjustments beginning March 26, 2020 to protect the health and wellness of employees as they continued providing essential transit service during the COVID-19 pandemic.

MARTA's Essential Service plan reduced the number of bus routes and allowed for a doubling of service on the busiest, most critical routes. Bus service was cut from 110 routes to just 40 routes in April 2020, leaving many riders left out without any bus service. However, those whose bus route was operating enjoyed upgraded service with increased frequencies as high as every 10 mins.<sup>7</sup> An excerpt of the initial essential bus service is shown in Figure 3. With the help of emergency federal funding from the CARES Act of 2020, 12 routes were reinstated as conditions allowed. With the installation of filters to rid the air of harmful pathogens on buses and the federally mandated mask requirement, some level of service was restored on all MARTA bus routes in April 2021.<sup>8</sup>

## Race and MARTA

**It is important to note that the MARTA bus system in place today is inextricably tied to the racist development patterns of Atlanta's past.**

Buses were sidestepped in the formation of the MARTA transit system when MARTA planners rejected the recommendation to expand the bus system based on the perception of buses as a second class mode of transportation. Instead, a plan for radial rail transit was crafted by the [Atlanta Regional Metropolitan Planning Commission \(ARMPC\)](#). In 1965, MARTA was officially established in four metropolitan Atlanta counties to fulfill this plan and in 1968, voters were asked to approve new property taxes to fund the system. The plan was defeated due in large part to Black voters rejecting the plan for its lack of transit serving Atlanta's Black population.<sup>9</sup>

A reworked plan including expanded bus service and an east-west rail line through Black neighborhoods garnered the support of voters on a 1971 one-cent MARTA sales tax referendum. However, this referendum only passed in two counties, Fulton and Dekalb, "largely due to Black voters in the City of Atlanta." Over the next several decades, the potential for MARTA to serve metropolitan Atlanta residents,

particularly Black residents, was curbed by the racial fear and prejudices of white people in the suburbs, an increased segregation of people and jobs, the lack of dedicated state funding, and the proliferation of auto-centric development.<sup>10</sup>

Today, the challenge facing Black and low-income bus riders is displacement caused by an influx of affluent, white residents into historically non-white intown neighborhoods with quality transit service. Displaced residents must often move to more affordable homes in the suburbs where transit service is lacking, creating inequitable access to jobs and other opportunities.

The impact of race on MARTA's bus stops is briefly explored in this report and will be the subject of future research. The MARTA Army encourages readers to refer to Opportunity Deferred, a report published in 2017 by Partnership for Southern Equity for a detailed account of race and transportation in the metropolitan Atlanta area.

## Overview of the MARTA Bus System

### MARTA Bus Stop Amenities

MARTA bus stops are located on major roads in participating jurisdictions, with a target spacing of 800-1200 ft (2-5 min. walk) between stops, road conditions permitting. MARTA bus stop locations are prioritized for installation of benches or shelters by considering equity, ridership, span of service, trip frequency, proximity to other shelters, Title VI Compliance, and local land use.<sup>11</sup> Ridership thresholds for adding amenities can be adjusted over time. As of 2018-2019, these thresholds were as follows:<sup>12</sup>

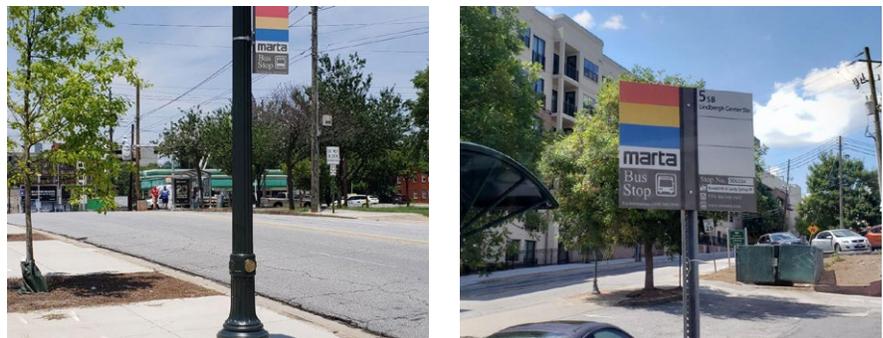
- Benches: 15 or more boardings per day,
- Shelters: 25 or more boardings per day.

Bus stop benches and shelters can be requested by contacting MARTA's customer service. Additionally, exceptions to these thresholds can be considered for stops used by riders with a greater need for seating, e.g. stops near hospitals or senior residences.

#### Signage

Most MARTA bus stops are identified by a "MARTA Bus Stop" sign mounted on a U-channel pole, lamp post, traffic light pole, or utility pole, as seen in Figure 4. The sign may occasionally include a panel indicating the bus routes at the stop for operational needs (e.g. where two routes split and a stop is only for one route) and to help orient riders in complex route/stop layouts. MARTA installs and removes stop signs as needed. If a bus stop has no shelter, then at a minimum a bus stop sign can be found.

**Figure 4** | Typical MARTA bus stop signs.



#### Shelters

Around 10% of the approximately 9,000 bus stops "feature amenities like shelters or benches,"<sup>13</sup> with new shelters being added regularly. Shelters typically include a canopy, seating, route schedules, and trash can. Many shelters are manufactured by Tolar Manufacturing,<sup>14</sup> and installed and serviced by Outfront Media through a contract with MARTA, as seen in Figure 5a. These shelters display posters or electronic advertisements.

MARTA added nearly 100 shelters between June 2019 and June 2020, more than was added between 2016 and 2019 combined.<sup>15</sup> Prior to June 2021, the total number of allowed shelters within the City of Atlanta was capped at 300 per city code.<sup>16</sup> The cap would have constrained future shelter installation and has since been removed.

**Figure 5** | (a) Left: A typical MARTA bus shelter and (b) Right: a bus shelter installed by the City of Sandy Springs.



## Overview of the MARTA Bus System

### MARTA Bus Stop Amenities

A small number of shelters are built and managed independently. Some examples include:

- Green-painted shelters near downtown Sandy Springs (city-managed) as seen in Figure 5b.
- Green-painted shelters in Roswell (city-managed).
- One custom-built shelter at Cascade Heights (owned and managed by the City of Atlanta).
- Bus shelters and covered structures built by private property owners on their property.

#### Standalone Benches and Trash Cans

Standalone benches and trash cans can be found at a number of bus stops where observed ridership does not warrant the installation of a shelter, as seen in Figure 6. Standalone benches provide resting opportunities, and trash cans help reduce litter and improve the appeal of the stop and the perception of safety at the stop. These amenities are installed and managed by local jurisdictions, private entities, and sometimes MARTA, depending on location. Note that some standalone benches, such as the one depicted in Figure 6a, have been installed without the consent or knowledge of MARTA, often display ads, and are deemed illegal.

**Figure 6** | (a) Left: Example of standalone, third-party seating and (b) Right: trash can installed from MARTA Army's Operation CleanStop in East Point, GA.



## Overview of the MARTA Bus System

# Responsibilities for bus stop maintenance and improvements

Because MARTA operates on roads controlled by different jurisdictions, the responsibility for bus stops and the surrounding environment varies. It is therefore important to insist on the fact that no one entity currently has the authority to address all issues that can be encountered at a bus stop. Typically, MARTA is responsible for the signage and most shelters, while sidewalk and road improvements are handled by either cities, counties, or the Georgia Department of Transportation (GDOT), depending on the entity that owns the road. The responsibilities and cost for handling each amenity are summarized in Table 1 and Appendix B, respectively.

**Table 1** | Responsibilities of Bus Stop Amenities in Atlanta

Amenities	MARTA	City	State	Private owner
Shelter	●	◐	—	○
Stop signage, schedules	●	—	—	—
Seating	◐	◐	—	◐
Trash can	◐ at MARTA- owned shelters & benches	◐	—	◐
Lighting	○	◐ City ◐ Utility	○	○
Sidewalk	—	◐	◐	◐
Crosswalk (incl curb cuts) Traffic Signals	—	◐	◐	◐

### Responsibilities

● Primary

◐ Partial, depending on location

○ Occasional

— No responsibility

SECTION 2

# Survey Design, Composition, and Administration



# Survey Design

## Focus Areas

The Bus Stop Census provides the ability to assess the safety, accessibility, and dignity of each bus stop surveyed. The following focus areas were selected as indicators of a bus stop's safety, accessibility, and dignity and form the basis for the questions included in the Bus Stop Census survey.

- 1. Seating**
- 2. Shelters**
- 3. Wayfinding Information**
- 4. Sidewalks and Crosswalks**
- 5. Boarding Area**
- 6. Trash Cans and Cleanliness**
- 7. Line of Sight**
- 8. Lighting**

## Survey Design

### Seating

Seating at bus stops includes any permanent structure that allows a person to sit while waiting for the bus. Seating can be installed by the transit agency that serves the bus stop, by a local city, property owners, Community Improvement Districts (CIDs), non-governmental organizations (NGOs), or by regular bus riders who desire a place to sit. Seating improves the comfort and overall dignity of a bus stop. Having a place to sit and rest or to place belongings makes waiting for the bus less strenuous. For people with disabilities or for senior riders, seating may be a necessary amenity for them to use the bus stop. Additionally, the presence of a bench dramatically reduces the perception of wait time.<sup>17</sup>

### Shelters

Shelters are physical structures that safeguard waiting riders from the elements such as the sun, rain, and snow. Protection from the elements is key to ensuring the bus stop can be utilized at all times of the year. Some shelters include wayfinding information and lighting. Wayfinding information at the shelters brings legibility to the transit network, helping riders understand or discover how to get around the system. Lighting gives riders waiting at the shelter an increased sense of safety. Similar to seating, shelters boost the comfort and dignity of the stop while also improving safety and legibility.

### Wayfinding Information

Wayfinding signage increases the legibility of the transit network served by the bus stop. [The National Association of City Transportation Officials' \(NACTO\) "Transit Street Design Guide"](#) states that "providing clear and simple information like route and system maps, schedules, expected travel times, real-time arrival times, and ridership procedures makes the system more attractive and simpler to use, and improves rider satisfaction."<sup>18</sup> As one of the first lines of hospitality, good wayfinding welcomes transit riders into the surrounding destinations and communities. Accessible wayfinding should be visible at the eye level of a wheelchair user and designed to be readable by those who have low vision, are color blind or have a learning disability.

The standard MARTA bus stop sign displays the MARTA customer service phone number, as seen in Figure 7. Although customer service contact information is not considered "wayfinding," a rider could use the customer service information to contact MARTA and learn more about the service. Additionally, MARTA shelters display the advertising company's customer service phone number for shelter maintenance.

**Figure 7** | Customer service contact information at MARTA bus stops.



## Survey Design

### Sidewalks and Crosswalks

Pedestrian safety is a key concern of the experience at MARTA bus stops because the majority of people who ride the bus access it by walking or rolling to a bus stop. The 2019 Regional On-Board Survey completed by the Atlanta Regional Commission (ARC) and its partners reported that 81.2% of participants surveyed accessed transit at the start of their trip by walking,<sup>19</sup> a large increase from the 2010 Regional On-Board Survey where 72% accessed transit by walking.<sup>20</sup>

People who walk to ride the bus are among the most vulnerable and at-risk pedestrians when it comes to fatalities and injuries caused by vehicles. In the Atlanta region, 75% of fatal pedestrian crashes occurred within 300 feet of a transit station or bus stop, and many MARTA bus stops are on the "High-Injury Network," i.e. arterial roads within the City of Atlanta with elevated counts of pedestrians injured in car crashes.<sup>21</sup> Figure 9 provides an overlay of the high-injury network over the median income by census tract. The yellow lines highlight sections of the high-injury network that are 1/2 mile or longer. The white dots represent bus stops surveyed in the Bus Stop Census. Each census tract is colored a different shade of pink/purple to denote median household income. Roads on the high-injury network are mostly found in the downtown area and the outskirts of the city, especially in neighborhoods

in south, west, and southwest Atlanta. These neighborhoods tend to have "lower median incomes, a larger share of Black residents, higher rates of walking and taking transit to work, and lower rates of vehicle ownership."<sup>22</sup> The residents in these communities are inequitably exposed to more pedestrian-vehicle collisions.

In addition, the Regional On-Board Survey found that transit riders with lower annual household incomes were significantly more likely to walk to transit service than those with upper incomes.<sup>23</sup> Pedestrian safety at bus stops is also essential when promoting the use of transit to families with young children. Georgia laws and Atlanta Public Schools regulations provide extra safety measures for school bus stops but these regulations do not extend to MARTA buses used by children.

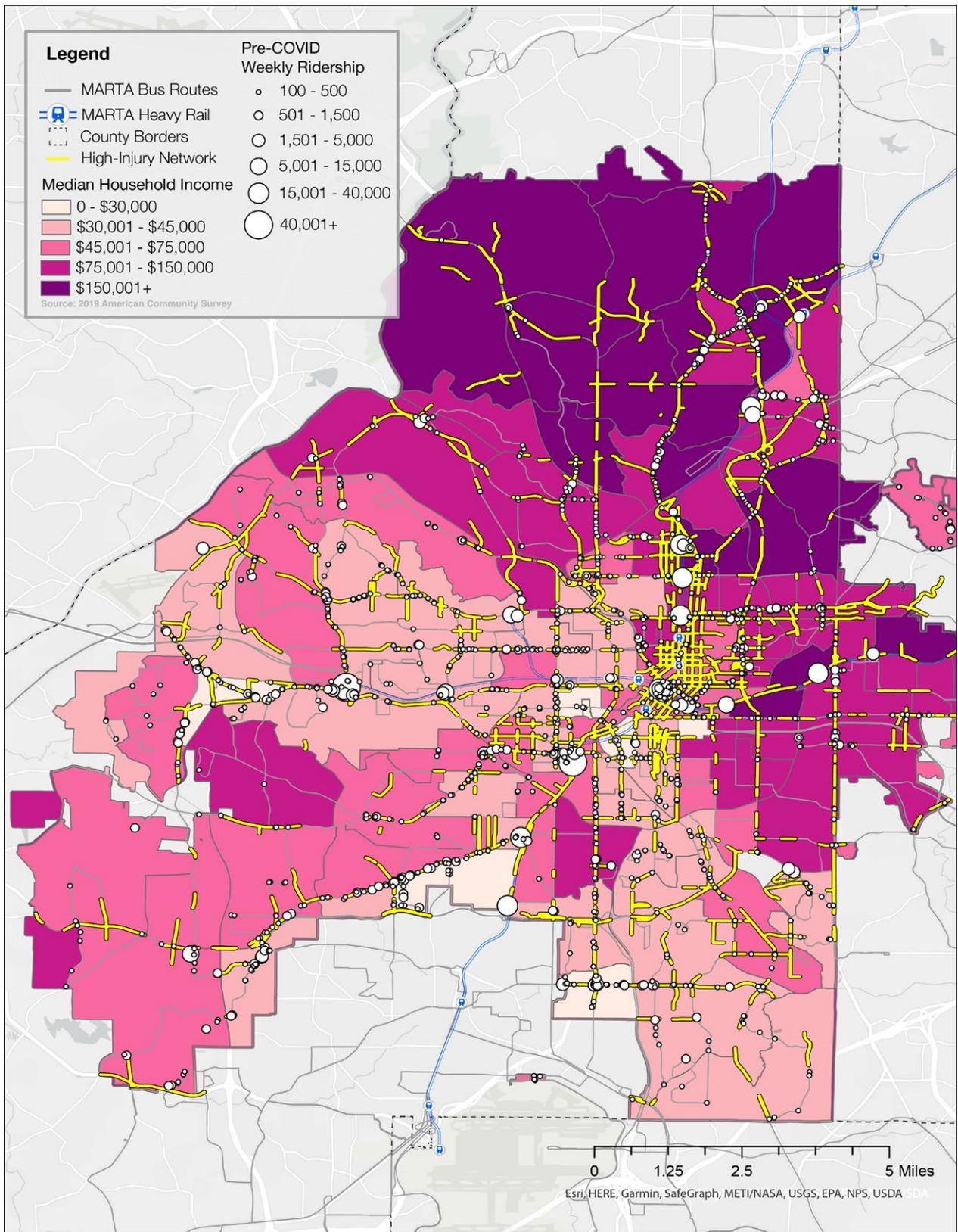
These facts and figures underscore the need to locate bus stops where sidewalks exist and where pedestrians can cross the street safely, or where sidewalks and safe crossing treatments can be created.

Unfortunately, current planning and design practices fall short of meeting this need. The PEDS "Safe Route to Transit Toolkit for Safe Crossings in Metro Atlanta" report highlights one contribution to this shortfall:

**Figure 8** | MARTA bus stop on Buford Highway, a high-speed road with few pedestrian crossings in Northeast Atlanta. Some passengers using this stop live in an apartment complex whose entrance can be seen on the opposite side of the road from the stop, far from crosswalks.



**Figure 9 |** Map of Simplified High Injury Network for Atlanta overlaid on median household income by census tract



## Survey Design

“To provide bus stops within walking distance of their customers, transit agencies often place them at locations other than signalized intersections. This is common on high-speed, multi-lane arterials, where signalized intersections are sometimes a half-mile to a mile apart.”<sup>24</sup> Transit agencies are also forced to place many bus stops close together when accessible sidewalks are missing in between destinations. Such unaccommodating road and sidewalk designs, in addition to other operational constraints, force MARTA to place bus stops where there are no adequate sidewalk connections and safe crossing treatments.

Without sidewalks, bus riders may be required to walk or roll in the street next to traffic. The absence of safe crossings near bus stops may force riders to cross a street with fast moving traffic or poor visibility conditions, as seen in Figure 8. These situations amplify the risk of bus riders being seriously injured or killed while walking to or from the bus stop.

In addition to safety, sidewalks and crosswalks influence the accessibility of a bus stop. Properly maintained sidewalks and crosswalks confer a great deal of autonomy to people with disabilities, parents transporting children in strollers, and older riders. The Americans with Disabilities Act (ADA) requires all

public transit vehicles to be accessible for persons who use wheelchairs or other mobility aids. Bus stops on roads without sidewalks, obstructed sidewalks, missing curb cuts for crossing streets, or on steep inclines, are inaccessible and prevent people with mobility disabilities from using transit altogether. As illustrated in Figure 10, the condition of sidewalks near MARTA bus stops varies widely. The safest and most accessible crosswalks are those that have crossing infrastructure such as traffic lights, curb cuts, crossing signals (visual and audio), and tactile guide strips as seen in Figure 11.

### Boarding Area

The boarding area is the space between the curb and the sidewalk that passengers must traverse in order to board the bus. It is also the surface on which the accessibility ramp of the bus would land when deployed. The size of the boarding area can vary between bus stops depending on the width of the sidewalk, the space between sidewalk and curb, the presence of a shelter, the size and quantity of seating, the amount of shade nearby, etc. The type of surface of the boarding area also varies: paved cement, grass, dirt, asphalt, or gravel. The incline of the surface of the boarding area may be flat or on an angle.

The size, surface type, and incline of the boarding area all affect the bus stop’s safety, accessibility, and dignity.

**Figure 10** | Examples of sidewalk and crosswalk conditions at MARTA bus stops.



## Survey Design

**Figure 11** | Example of a painted crosswalk with curb cut, tactile strip, and crossing signals at a MARTA bus stop.



**Figure 12** | Example of a bus stop hidden by excessive foliage, and where riders would need to lean into the roadway to flag the bus down.



In regards to safety, a boarding area that consists of a small patch of grassy hill may force riders to wait in the road next to oncoming traffic, creating safety hazards for both the bus riders and vehicle drivers. In relation to accessibility, boarding areas with uneven surfaces may prevent people using durable medical equipment from reaching the bus stop. The potential safety and accessibility issues described here reflect a small subset of the myriad of ways an insufficient boarding area can negatively impact riders, underpinning the need to understand the state of boarding areas in the bus stop population.

### Trash Cans and Cleanliness

Cleanliness impacts the dignity of a bus stop. Prolonged cleanliness issues make the bus stop less inviting. Additionally, trash items such as cups and food cartons left around the stop or on the sidewalk can impede the path of travel for a person with a disability from boarding or accessing the stop. Trash cans help reduce litter and improve the appeal of the stop and the perception of safety at the stop<sup>25</sup> and in the neighborhood.<sup>26</sup> A clean, well-maintained bus stop makes the rider feel respected and lets them know the transit agency serving the stop cares about their experience waiting at the stop.

### Line of Sight

Line of sight refers to the bus operator's ability to clearly see the bus stop and riders waiting there. An obstruction may occur if there is excessive foliage, parked vehicles, or a sharp road curvature. Figure 12 illustrates a bus stop where riders would have to lean into the roadway to flag the bus down because foliage is blocking visibility of the bus stop sign and sidewalk from the bus driver's view. If the line of sight is obstructed, a rider might have to put themselves at risk to step into the roadway or lean into traffic to flag down the bus. For those with limited mobility who cannot do this, the risk is being missed by the bus altogether.

A clear line of sight also allows bus riders to see oncoming traffic in both directions when attempting to cross the street. Bus riders need to see a far enough distance in both directions to safely make their across the entire width of the street. Challenging topography, such as hills and curves, make a clear line of sight impossible.

### Lighting

Lighting at a bus stop has the potential to increase the perception of safety by people waiting for a bus<sup>27</sup> and may deter nefarious behavior.<sup>28</sup> Adequate lighting can aid individuals with low vision. It also lets motorists and bus operators see people waiting at or crossing near a bus stop, reducing the chance of a vehicle-pedestrian collision or an unsafe stopping for passengers inside the bus and for vehicles behind the bus.

# Survey Composition

The survey is designed to collect information on the condition and quality of each individual bus stop. The survey consists of 22 questions that vary from “yes” or “no” questions to free response entries. Each survey question falls into one of four categories:

- 1. Service Information**
- 2. Survey Detail**
- 3. Primary Bus Stop Characteristics**
- 4. Secondary Bus Stop Characteristics**

Each category and the corresponding questions are described in the following sections. The order of the questions listed in this report is not the order in which they appear in the survey. To see the order of questions in the survey, please reference the paper copy of the survey in Appendix A.

## Survey Composition

### Service Information

The Service Information questions ask for information to identify the bus stop: stop ID, main street, cross street, routes serving the stop, and travel direction.

#### Stop ID

This short-answer question asks the surveyor for the unique identification number of the bus stop. When using the online MARTA Army Bus Stop Census map to access the survey, this field is pre-filled with the stop ID as published in MARTA's [General Transit Feed Specification \(GTFS\)](#) data.

#### What street or road is the bus stop located on?

This short answer question asks for the name of the street or road the bus stop is located on. When using the online MARTA Army Bus Stop Census map to access the survey, this field is pre-filled with the stop name as published in MARTA's GTFS data. The stop name contains the name of the street the bus stop is located on and the closest perpendicular street. The two components of the street name will throughout this report be referred to as main street and [cross street](#) respectively.

#### What is the nearest cross street or landmark?

This short-answer question asks the surveyor for the name of the nearest cross street or landmark to the bus stop. When using the online MARTA Army Bus Stop Census map to access the survey, this field is pre-filled with the cross street (or landmark) as published in MARTA's GTFS data

#### What routes serve this bus stop?

This short answer question asks the surveyor to list the route numbers served at the stop separated with a comma. When using the online MARTA Army Bus Stop Census map to access the survey, this field is pre-filled with the route numbers.

#### Which direction is the bus heading from this stop?

This multiple choice question asks the surveyor to select whether the travel direction of the bus is Northbound, Southbound, Westbound, Eastbound, or "I don't know" from this stop.

### Survey Metadata

Two questions in the survey provide metadata on the survey itself. The first question asks for the surveyor's email address. This is an optional question used for the prize giveaway and to follow up with any questions about the surveyor's response. The second asks whether the survey was performed on-site.

#### What is your email address?

This short-answer question asks the surveyor to provide an email if they wish to be included in the prize giveaway.

#### Did you complete this survey at the physical location of the bus stop?

This yes / no question asks whether the surveyor performed the survey in person at the bus stop or if it was completed remotely. Surveys completed remotely may not reflect the most current situation as images on Google Maps may be a few years old. Additionally, surveys completed remotely may not have prior knowledge and experience using the stop.

## Survey Composition

### Primary Bus Stop Characteristics

For the purpose of processing and analyzing the data, the questions pertaining to the conditions and physical amenities and infrastructure present at bus stops fall in one of two categories: Primary and Secondary Bus Stop Characteristics.

Primary Bus Stop Characteristics are best defined as attributes that are most easily identified upon a first visit to a bus stop. These are amenities and infrastructure that can be inventoried visually by anyone whether it is their first time at the bus stop or whether they are a regular user of the stop.

#### **Does the stop have a bench or other seating?**

This multiple-choice question asks the surveyor if the seating at the bus stop is provided by the transit agency, someone else, or is non-existent. This question attempts to capture the seating options available at each bus stop, whether it was installed by MARTA or another entity. Seating includes benches, Simme-Seats, and seating in the form of benches provided at shelters.

#### **Does this stop have a shelter?**

This yes / no question asks the surveyor if a shelter exists at the bus stop. A standard MARTA shelter comes with seating, a covering, lighting, and wayfinding information.

#### **Does the bus stop include a trash can?**

This yes / no question asks the surveyor if a trash can exists at the bus stop.

#### **What wayfinding information is present at the stop?**

This multiple-choice question asks the surveyor if the route number, route schedule, route map, customer service contact information, and/or no wayfinding information are present at the stop.

#### **Is the wayfinding information located at the eye level of a person using a wheelchair?**

This multiple-choice question asks the surveyor if the wayfinding information, if present, is located at the eye level of a person using a wheelchair.

#### **Is there a paved sidewalk to the [boarding area](#) of the bus?**

This multiple-choice question asks the surveyor if a paved sidewalk to the boarding area of the bus stop is present in both directions, present in only one direction, or not present.

#### **What is the surface of the boarding area?**

This multiple choice question asks the surveyor to identify the surface type of the boarding area as concrete sidewalk, dirt or grass, asphalt, gravel, or brick pavers. The surface of the boarding area is the space between the curb and the sidewalk where passengers must traverse in order to board the bus and the area where the bus ramp would reach if deployed. If there is a narrow patch of thin grass, gravel, or mud between the curb and a concrete sidewalk that could be avoided using the bus ramp or by stepping over, it generally does not count as the boarding area surface type.

#### **Is there a clearly painted crosswalk within 100 feet of the bus stop?**

This multiple-choice question asks the surveyor whether there is, within 100 feet of the bus stop (the approximate length of 3 MARTA buses lined up end-to-end), a clearly painted crosswalk is present on the main street, on the cross street, whether the paint on the crosswalk is faded or worn away, or no painted crosswalk is present. Selecting "a crosswalk on the main street" means that at least one painted crosswalk is available to

## Survey Composition

cross the street the bus is traveling on at the location of the stop. It does not consider whether there is a crosswalk to cross the main street from both sides of an intersection. Selecting “a crosswalk on the cross street” means there is at least one painted crosswalk to cross the street that is intersecting the street the bus is traveling on at the location of the stop.

It does not consider whether a crosswalk is painted on the opposite side of the main street. Selecting “faded crosswalk” means the bare asphalt / concrete is exposed where crosswalk paint would normally be, or the paint is faded to barely visible. A faded crosswalk does not include thin cracks in the paint. The selection of “a faded crosswalk” does not differentiate between the main street or cross street. Unmarked crosswalks were not captured in this survey effort.

The purpose of this question is to identify bus stops without a nearby crosswalk where riders may be susceptible to crossing midblock, a potential safety hazard at some bus stop locations. Although studies show the distance that people are willing to walk is slightly more than 100 feet (figures for the distance people are unwilling to walk out of their way to get to a crosswalk range from 200 feet<sup>29</sup> to 300 feet<sup>30</sup>), 100 feet was chosen for this survey effort as the distance from the bus stop to the crosswalk because it is easy to verify using the relative distance of other familiar objects (such as 3 MARTA buses).

This means some bus stops surveyed had crosswalks slightly further than 100 feet but were marked as having no crosswalk. One-hundred feet serves as an imperfect measure for this survey effort as it provides a narrow understanding on the safety and condition of crossing near bus stops. Factors surrounding the context of the bus stop including street design, stop spacing, driveway positioning, and road type (e.g. [arterial](#) or residential) also impact the use of a crosswalk even if it is present and clearly marked. The answer to this question provides a limited view of the bus stop crossing infrastructure and could be paired with other data such as road type, ridership count, surrounding destinations, and actual distance from the nearest intersection to obtain a more complete understanding of its crosswalk needs.

### **What features does the crosswalk(s) have?**

This multiple-choice question allows surveyors to specify the features listed above that are present at the crosswalks nearest the bus stop.

## Survey Composition

### Secondary Bus Stop Characteristics

Secondary Bus Stop Characteristics include all questions whose answers may vary based on external factors such as the time of day, the surveyor submitting the response, or even the season of the year. For example, the question "Is the stop well lit at night?" fits under Secondary Bus Stop Characteristics because if a surveyor visited the stop during the daytime, they would have to make an assumption whether the bus stop had adequate lighting.

As the census effort relied heavily on remote surveying, this visual confirmation of lighting could not be fully verified. Similarly, a question on observed pedestrian and motorist behavior is also included in this category as first-hand experience waiting at the bus stop would be needed to give an accurate answer. Secondary bus stop characteristics answers are more anecdotal and qualitative to provide a more complete story about each bus stop.

#### **Does the bus stop have any of these cleanliness issues?**

This multiple-choice question asks the surveyor to indicate if there is litter, graffiti or tagging on amenities, an overflowing or poorly maintained trash can, or a dirty seating area at the stop. Respondents could enter additional details about cleanliness issues they may have encountered.

#### **If you had to flag the bus down, would you have to step into the roadway or lean into traffic?**

This yes / no question asks the surveyor to indicate if a person waiting at a bus stop would be visible to a MARTA bus driver.

#### **Is the stop well lit at night?**

This yes / no question asks the surveyor to indicate if the bus stop is well lit at night. Surveyors visiting the stop in daylight or online should have responded they did not know whether the stop is well lit at night.

#### **Are there any obstacles on the path to or at this bus stop that would limit the mobility of a person using a wheelchair or stroller? (e.g., trash cans, telephone poles, landscaping, uneven pavement, sloping, etc.)**

This yes / no question asks the surveyor to identify possible accessibility issues related to obstacles on the path to or at this bus stop that would limit the mobility of a person using a mobility device or stroller. Examples of obstacles include trash cans, telephone poles, landscaping, uneven pavement, sloping, and temporary construction. A follow-up open ended question asks surveyors to briefly describe any obstacles on the path.

#### **Have you observed any of the following pedestrian behavior at this stop?**

This multiple-choice question asks surveyors to indicate where they have observed riders walking on informal pathways to the stop, riders competing for seating, riders crossing mid-block, riders running to catch the bus, and dangerous motorist behavior. The surveyor can also indicate if they had never been to the bus stop before or are regular users of the stop but have not observed any of the aforementioned pedestrian behavior.

#### **Do you have any additional observations or anecdotes for this bus stop?**

This free response question gives surveyors space to provide additional anecdotes or observations to their response not already covered in the previous questions.

## Survey Composition

# Online Surveying Platform

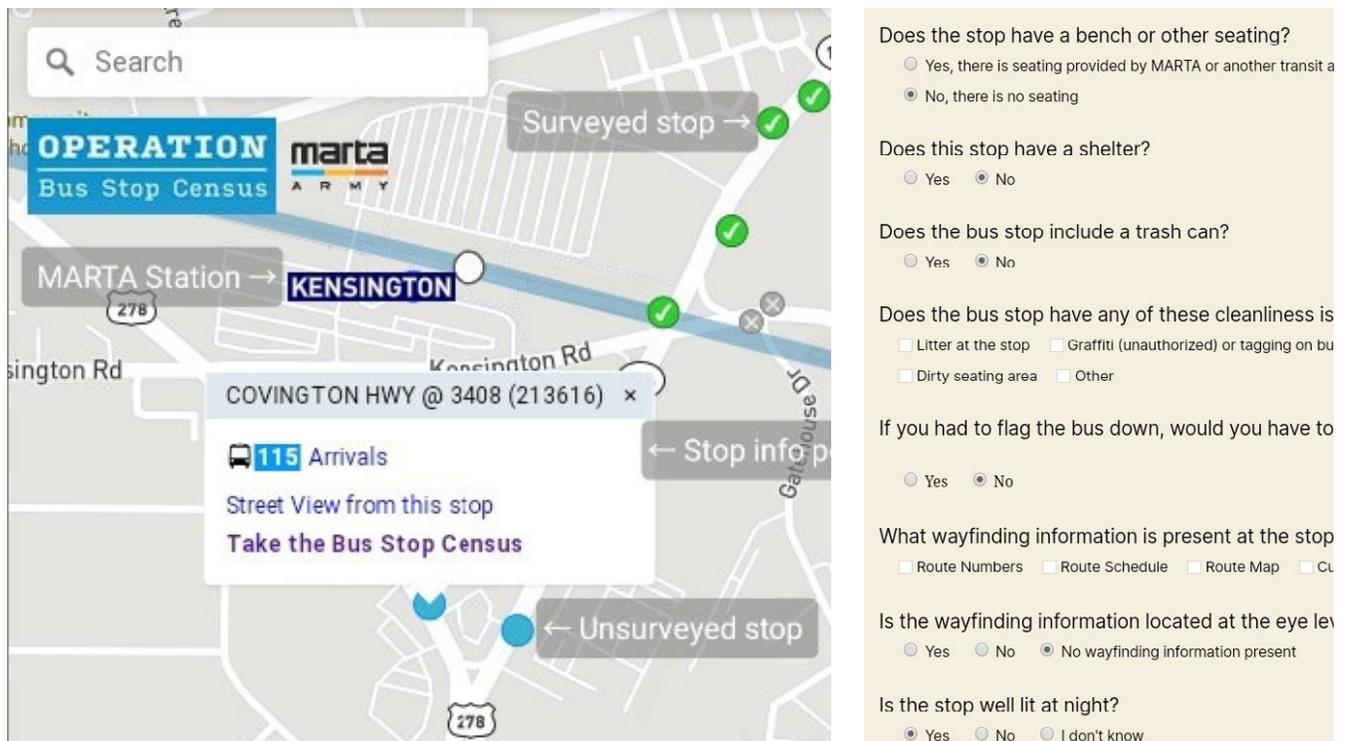
MARTA Army developed an online survey platform accessible at [www.busstopcensus.com](http://www.busstopcensus.com) on computers and mobile devices. The surveying platform consists of an interactive map displaying the location of each MARTA bus stop and a web page containing the Bus Stop Census survey form, as seen in Figure 13.

The interactive map makes it easy for surveyors to find a bus stop. If it is near a MARTA station, they can click on that station symbol, and the map zooms to show bus stops nearby and street level detail. Surveyors can also search for a specific address or location by typing it into a search box provided in the top left corner. The

map takes advantage of the user's device location services to center the map on their current location.

MARTA bus stops are denoted on the map with circle markers. The circle markers are assigned different colors and icons to denote the different statuses of the stops. Surveyed stops appear with a green marker with a check mark inside. Stops in need of surveying appear as a blue marker. Stops on routes suspended due to the COVID-19 pandemic appear grayed and crossed out, or if they were surveyed, a lighter shade of green with a check mark.

**Figure 13** | Operation Bus Stop Census Survey Platform features an interactive map of bus stops and web page containing the survey form.

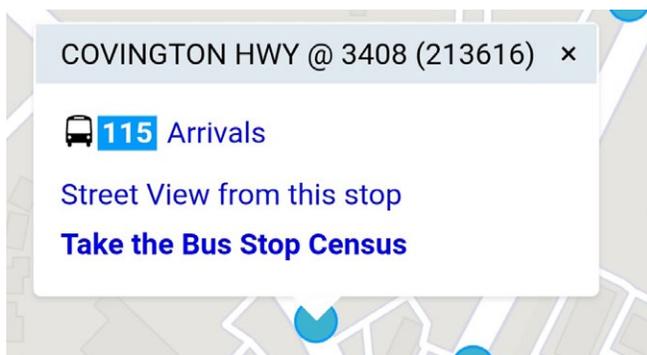


## Survey Composition

Clicking a stop opens a popup with information so that surveyors can confirm they are considering the correct stop, as seen in Figure 14:

- Stop name and ID
- Routes serving the stop, with a link to the next arrivals (the same link that provides access to real-time MARTA bus arrivals is found on MARTA Army's Operation TimelyTrip signs that were distributed in the past)
- Link to the Bus Stop Census Survey
- Link to the Google Street View for the bus stop location.

**Figure 14** | Popup display to confirm surveyors are considering the correct stop.



To facilitate remote surveying during the COVID-19 pandemic (and to help solve ambiguous survey answers during data processing), a link is provided that opens Google Street View at the location of a selected bus stop. Google Street View lets surveyors inspect the surroundings of bus stops, including sidewalks, nearby crosswalks, road conditions, and surrounding vegetation and visibility conditions.

Bus stop information such as the stop ID, the main street on which the stop is located, routes serving the stop, and the stop latitude and longitude are gathered from MARTA's public GTFS feeds published at the time Operation Bus Stop Census launched. Clicking the link to the Bus Stop Census survey opens the survey form in a new browser tab. The survey form is automatically filled with the bus stop ID, main street, cross street, and route numbers to avoid errors and to make the survey completion less arduous for surveyors.

Surveyors answer the remaining questions for the surveyed bus stop. They can upload images from their computers or take and submit pictures using their mobile devices while surveying bus stops in person. Once the surveyor has completed the form, they can click the Submit button, and a confirmation of survey receipt is shown.

Survey submissions are recorded in a database. Notification emails with photos of bus stops are also sent to MARTA Army survey administrators each time a survey is submitted. Although real-time survey status was not implemented, the survey map was updated at regular intervals during the survey period.

# Survey Administration

**The Bus Stop Census 2020 survey was available online to the public from February 4, 2020 to December 31, 2020. Online survey responses were self-administered and crowdsourced from the general population. MARTA Army hosted a variety of virtual and in-person events following at the time COVID-19 protocols to collect feedback from surveyors, focus surveying effort, and encourage participation.**

## Remote Surveying

A month after the launch of Operation Bus Stop Census on Transit Equity Day, the world shut down because of the COVID-19 pandemic. To accommodate people staying home to prevent infections, MARTA Army pivoted to remote surveying. A link to Google Street View was added to the online surveying platform so surveyors could fill out surveys from home using wide-lens imagery of streets and bus stops recorded by Google vehicles. Google Street View images are updated periodically (at least once a year for most street segments) , serving as an adequate alternative to surveying in-person. In-person surveying remained an option, as long as surveyors did so safely, with proper social distancing in the presence of others.

Despite the convenience it provides, remote surveying has one major limitation. Images recorded in Street View are only a snapshot of the bus stop conditions and the surrounding environment. Still images do not always capture the complex characteristics of a bus stop that may require the surveyor to observe the bus stop at certain times during the day or for an extended period of time. Such characteristics include the sense of safety felt waiting at the bus stop, the nighttime lighting conditions, the presence and frequency of litter, the growth of foliage during the spring and summer, the speed of passing cars, the impact of obstacles on the path of the sidewalk, and number of riders who cross midblock. Remote surveyors were encouraged to use their best judgment and make note of characteristics that are difficult to determine from Google Street View.

## Survey Administration

### Marketing and Community Engagement

Crowdsourcing, a key aspect of MARTA Army's initiatives, cannot be done without the crowd. The marketing and community engagement strategy for the Bus Stop Census sought to introduce as many riders to the initiative as possible while focusing engagement efforts on in-person and remote surveying events.

#### Digital Advertising

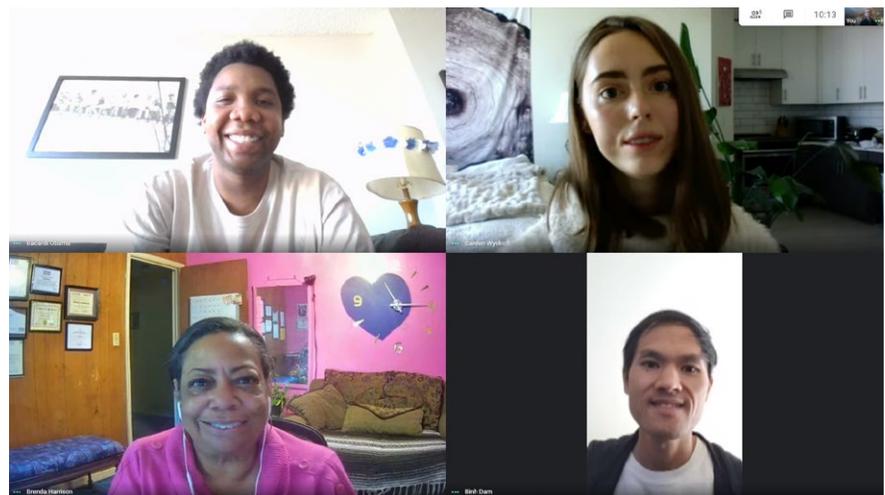
Throughout the Bus Stop Census, MARTA Army used social media, primarily Twitter and Facebook, to market the initiative to potential surveyors. MARTA Army posted announcements, progress reports, and infographics to both platforms to keep Bus Stop Census participants informed and to attract new surveyors. For Facebook, MARTA Army purchased ads targeted towards users near MARTA stations. In total, MARTA Army's Bus Stop Census posts reached tens of thousands of users on Twitter and Facebook and contributed to hundreds of engagements with the census survey. There was a noticeable uptick in surveys submitted after ads were placed on Facebook.

#### Remote Surveying Events

As the pandemic forced the nation into lockdown, MARTA Army took advantage of the Bus Stop Census' remote surveying capabilities to host online remote surveying events. MARTA Army held three remote surveying events in total.

MARTA Army kept track of the percentage of bus stops surveyed on each bus route. (The table in Appendix C is the final snapshot of such tracking). Before each remote surveying event, MARTA Army determined routes where the percentage of bus stops surveyed was low. MARTA Army then created a signup.com form where participants could sign up for a route and receive a meeting invitation. On the day of the survey event, participants joined the meeting electronically and performed their surveys (Figure 15). The event was a time for people to survey, discuss current transit related events, and answer any questions about the surveying process.

**Figure 15** | Screenshot of a virtual bus stop surveying event.



## Survey Administration

### Marketing and Community Engagement

The Survey-A-Thon in December marked the last remote surveying event before the end of data collection. The Survey-A-Thon was holiday themed and in addition to surveying stops, included MARTA trivia, prize giveaways, and interactive games.

In total, 22 people participated in the remote surveying events and contributed more than 250 surveys.

#### In-Person Survey Events

At the beginning of Bus Stop Census 2020, MARTA Army planned for a series of in-person survey events throughout the MARTA bus network. These plans were put on hold as COVID-19 sent the nation into lockdown. During the Bus Stop Census, only two in-person survey events were held. One was held at the beginning of the initiative at Kensington Station, surveying Route 115. The second was coordinated with the South River Gardens Neighborhood, described in detail next in “Neighborhood Planning Units”.

**Figure 16** | Community surveying event in South River Gardens.



#### Land-Use, Transportation, and Zoning-Related Matters

Neighborhood Planning Units (NPU) are citizen advisory councils designed to provide recommendations to the Mayor and City Council on zoning, land-use, and transportation related matters. NPUs are considered a strong outreach opportunity because of their ability to contact and organize neighborhood residents.

MARTA Army presented the Bus Stop Census initiative to multiple NPUs during the summer of 2020. The most significant outcome of these presentations was the community survey event with South River Gardens.

After a presentation to NPU-Z, a planning unit located in southeast Atlanta, the leaders of the South River Garden neighborhood within NPU-Z contacted MARTA Army to schedule their own community survey event. In October, MARTA Army joined members of the community in South River Gardens to survey bus stops along Route 55 (Figure 16). The surveys were compiled and the summarized and raw data was presented to the [NPU](#).

## Survey Administration

### Marketing and Community Engagement

#### Survey Prize Giveaway

MARTA Army incentivized public participation through the use of a prize giveaway. Three grand prizes were awarded for the top surveyors at the end of the data collection period. All other surveyors earned prizes depending on the number of stops they surveyed. The more bus stops surveyed, the more prizes one could receive. The general prize structure is shown in Figure 17. In total, 50 prizes were awarded to 19 surveyors who surveyed a combined total of 2,808 stops.

**Figure 17** | Social media marketing of the prize platform.

#### OPERATION BUS STOP CENSUS: Prize Structure

One item per person per prize tier. Surveys must be registered to the same email to count towards total. Window to be qualified to earn prizes ends either after Dec 31 or when 2500 unique stops are surveyed.



#### Progress Updates and Focus Routes

To encourage public participation in the census, MARTA Army posted frequent progress updates with the list of top surveyors, a weekly surveyor spotlight the goal progress, and a countdown till the end of data collection. The posts also identified focus bus routes that either had less than 25% of the stops surveyed or were high ridership routes with a low percentage (less than 50%) of stops surveyed.

The initial goal of the survey effort was to survey 2,500 stops by July 4, 2020. This deadline was pushed to December 31, 2020 due to the COVID-19 pandemic. After meeting the initial goal in mid-December, a secondary goal to survey at least 25% of all bus stops designated as "essential" routes by MARTA during the pandemic was established. Social media posts promoted this new goal and identified these routes as priority survey routes.

SECTION 3

# Data Quality Control and Quality Assurance



# Data Cleaning and Validation

Crowdsourced data collection naturally results in quality issues that must be resolved. MARTA Army performed quality assurance throughout Bus Stop Census 2020, from data collection to final data cleaning and validation. Data quality issues can arise from multiple causes:

- A surveyor made a mistake and notified MARTA Army that they wished to correct it.
- A surveyor leaves a question blank because they may not know the answer (e.g. travel direction, routes at a stop).
- A survey question may be ambiguous (e.g. availability of lighting, dangerous travel/rider behaviors near a stop).
- A surveyor may submit multiple responses for the same bus stop with different responses included in each submittal.
- Multiple surveyors submit responses to the same bus stop with different responses for the same questions.
- Surveyors respond with contradictory or illogical responses to one or more questions.

To address these issues, quality assurance was completed in multiple stages as depicted by the flowchart in Figure 18:

**Figure 18** | Flowchart of data quality assurance.



## Anonymize Data

Personal Identifiable Information (PII) such as email is removed and replaced with a random UUID (user-unique ID) in the published survey results.

## Pre-Process Raw Data

The raw survey data is pre-processed to accommodate for inconsistencies in the survey database and survey changes in the course of the census:

- Identical records and fields no-longer in use are removed.
- Field values such as "NA" and dates are normalized.
- Surveys, comment fields and corrections submitted by surveyors at a later time are merged into the survey response. (The most recent answers are typically kept.)

## Check for Completeness

Additional checks are performed to ensure all fields of a survey are populated:

- The stop ID must be valid.
- Missing answers, for instance, from questions added after surveyors began submitting responses, are flagged:
  1. Boarding area material,
  2. Obstacles and obstacle description,
  3. Crosswalk features.

## Review Consistency

### Contradictory Responses

A thorough review is performed to reconcile contradictory answers in surveys that provide a qualitative description for, and also mention the lack of these amenities:

- sidewalks (including obstacles),
- crosswalks,
- wayfinding features,

- trash cans,
- seating cleanliness,
- dangerous behaviors.

A survey is performed by the person reviewing the data who determines the final values to use, considering the bus stop characteristics defined in the Survey Composition section.

### Wayfinding

Answers regarding wayfinding are also revised, as we realized the survey did not clarify what constitutes wayfinding:

"Customer Service Information" (the phone number shown on all MARTA stop signs and shelters) is added to all surveyed stops as a wayfinding feature. Surveyors tend to ignore that piece of information, however we felt the need to mention that a MARTA phone number is normally available at all stops.

**Figure 19** | Placement of route schedules and maps at MARTA shelters (top, non-accessible to wheelchairs) and MARTA map poles (bottom, accessible to wheelchairs, source: Google Street View).



Wayfinding that is other than “Customer Service Information” is marked as not accessible at bus shelters. This action is necessary because at most shelters, route schedules and maps are not at eye level for wheelchair users, as seen in Figure 19.

## Add Reference and Spatial Data

To provide a situational and geographical reference, additional fields are added to each survey response from MARTA’s published GTFS data:

- Route numbers.
- Route direction (e.g. northbound).
- Normalized street names (e.g. “MLK Jr. Dr.” and “Martin Luther King Drive” refer to the same road).
- Bus stop latitude and longitude.

The county and city are determined for each bus stop by mapping their coordinates into OpenStreetMap and retrieving the name of the county and city/neighborhood they are located in. This is done so statistics for survey results can be grouped by jurisdiction (e.g. number of stops without sidewalk in Fulton County).

## Publish Data and Data Processing Script

The raw anonymized data, processed data, and the code to process the data are available open source at <https://github.com/martaarmy-barracks/busstopcensus>, so that others can reproduce the steps of the data cleaning steps described above. The data is in CSV format, and code is written in R (<http://www.r-project.org>).

## Limitations of the Data

Although the data collected through Operation Bus Stop Census 2020 are rich in information and representative of a large proportion of the MARTA bus network, they have limitations. We list some of them below. This list is not exhaustive, and anyone using the data should consider other limitations that result from crowdsourcing the data.

- a. **Crowdsourced data is subject to inaccuracies.** Crowdsourcing information on bus stops allowed for the large scale collection of surveys but also introduced inaccuracies. Surveyors may interpret questions differently than intended or may have not entered an accurate response, whether intentionally or not. Many of these inaccuracies were identified and corrected in the QA/QC process, but there are likely some that still exist with the processed data. MARTA Army is confident that the quantity of surveys collected provides an accurate view of the conditions of bus stops surveyed even if inaccuracies still exist.
- b. **Remote bus stop surveys used old Google Street View Images.** Because the pandemic forced the surveying process to migrate online, MARTA Army relied heavily on Google Street View to survey bus stops throughout the metropolitan area. Many of the surveys conducted used Google Street View images that were between 6 to 18 months old, depending on when the images were taken and whether a street is more or less often frequented. It is possible that the conditions of a bus stop changed between the time the Google Street View image was taken and when the survey was conducted. MARTA Army accepted this possibility and assumed that most bus stops did not undergo significant changes within that time period. Thus, the surveys collected are believed to provide a representative snapshot of their conditions even if a small proportion experienced significant changes.
- c. **Ridership data are for pre-COVID time frame.** The ridership data (boardings and exits (or alightings)) data used for this report are from November 1-15, 2019.
- d. **Findings from Bus Stop Census 2020 are only for bus stops surveyed.** The bus stops surveyed represent over a quarter of the total number of bus stops in the MARTA bus network. Although the findings from the bus stops surveyed give great insight into prevalent issues in the network, they cannot be extrapolated to the entire population of bus stops.

SECTION 4

# Key Findings from Survey Responses



# Characteristics of Bus Stop Census Responses

## Survey Summary

In total, 3,421 surveys were collected from February 4, 2020 to December 31, 2020. These surveys represented 3,248 unique MARTA bus stops. This total exceeded MARTA Army's goal of 2,500 bus stops surveyed by 30%. Of these surveyed stops, 2,850 are a part of the Essential Service Plan (53% of the 5,378 "essential" stops). This total exceeded MARTA Army secondary goal of surveying at least 25% of all bus stops designated as "essential" routes by MARTA during the pandemic. The surveys covered 85% or more of the stops on twelve bus routes, providing a nearly comprehensive bus stop profile for these routes (see Appendix). These large efforts were made possible with help from 293 identifiable surveyors and potentially more unique surveyors that left the email field blank.

The majority of the surveyed stops are in the City of Atlanta and DeKalb County (covering 44% and 29% of the stops in those jurisdictions, respectively). Though the magnitude of the stops surveyed in Clayton and Fulton County was less than City of Atlanta and DeKalb, the proportion of stops surveyed in those counties was over a quarter (24% and 33% respectively). Finally, some surveyed stops were outside of the main jurisdictions making up MARTA's service area. These stops are located in Cobb County near the Cumberland Transfer Center. Table 2 shows the total stops surveyed by jurisdiction.

**Table 2** | Number of stops surveyed by jurisdiction.

Jurisdiction	Number of Stops	Number of Stops Surveyed	Percent of Stops Surveyed in Each Jurisdiction
City of Atlanta	3,785	1,672	44%
Clayton	640	155	24%
DeKalb	3,169	921	29%
Fulton	1,495	497	33%
Other	13	3	23%

## Seating

Over 80% of bus stops surveyed have no seating. These bus stops account for 59% of the average weekly ridership. Only 19% of bus stops surveyed have seating (provided by either MARTA or another entity), accounting for a combined 41% of the average weekly ridership. Table 3 summarizes seating availability at bus stops surveyed.

**Table 3** | Number of surveyed stops with and without seating, and affected ridership.

Answer	Count of Bus Stops	Percent of Total Stops (N=3,248)	Total Avg. Weekly Ridership	Percent of Total Avg. Weekly Ridership
<b>Yes, there is seating provided by MARTA or another transit agency</b>	447	14%	238,137	35%
<b>Yes, there is seating provided by someone else</b>	170	5%	42,154	6%
<b>No, there is no seating</b>	2,631	81%	402,194	59%

The four primary kinds of bus stop seating are pictured below in Figure 20. The first is the grey bench with blue sidings provided by MARTA. The second and most prevalent form of seating is the bench provided at MARTA shelters. The third form of seating are benches provided by a local jurisdiction like the ones in the bottom left image. The fourth and less common seating type is the Simme-Seat, a small bench attached to the bus stop sign pole pictured bottom right in Figure 20.

**Figure 20** | Types of seating observed in Bus Stop Census

(from left to right: MARTA provided bench; seating provided at MARTA shelter; seating provided by local jurisdiction; Simme-Seat on bus stop sign pole; Source: Google Street View).



The location of surveyed stops with vs. without seating is shown in Figure 21. Note that the stop markers on the map do not include direction of travel (e.g. Northbound vs. Southbound).

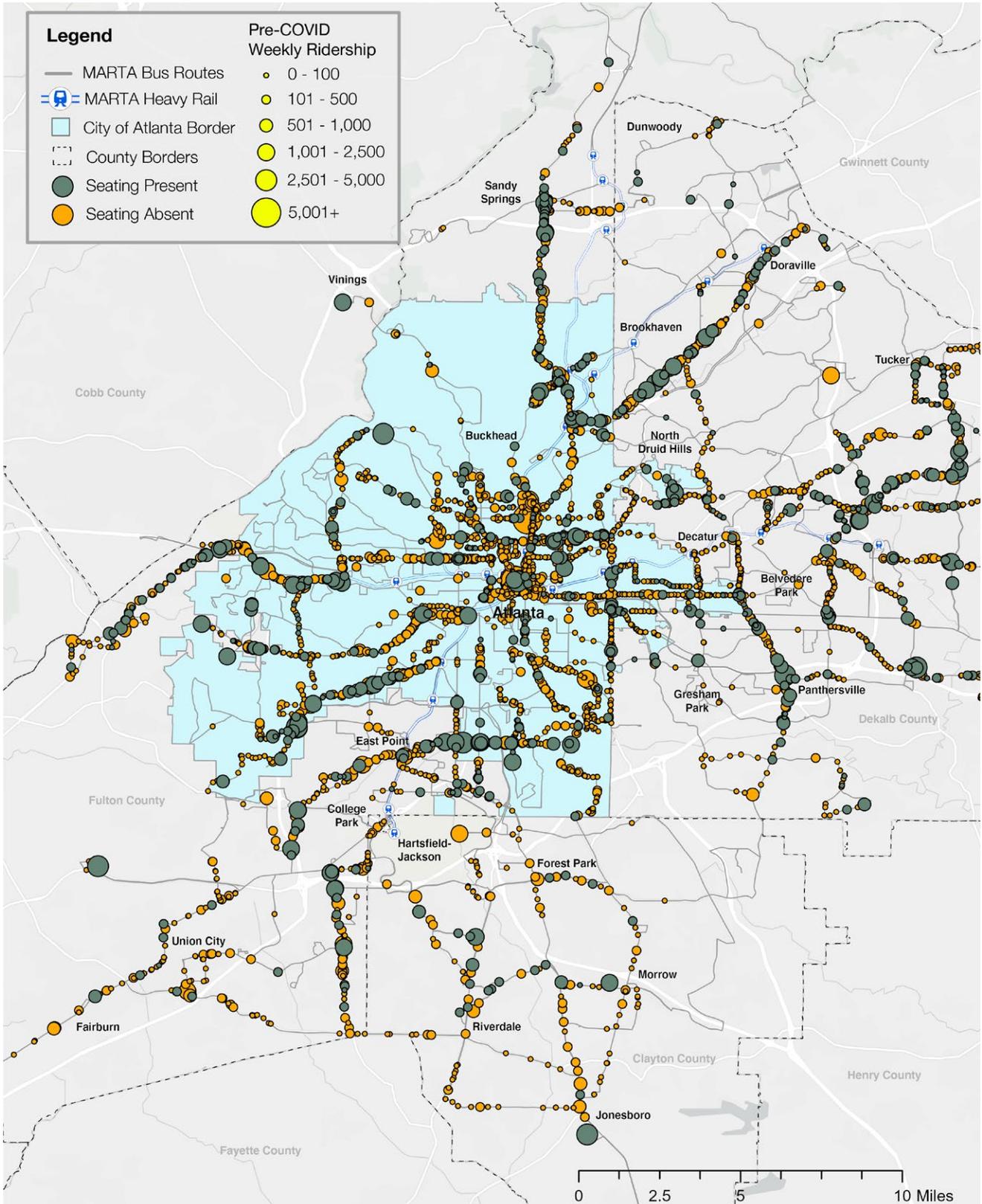
Many surveyed stops with comparatively high-ridership (pre-COVID-19), denoted with large dark dots, already have seating, such as along the busiest bus routes:

- Buford Highway (Route 39),
- Campbellton Road (Route 83),
- Cleveland Avenue (Route 78),
- Ponce de Leon Avenue (Routes 2, 102),
- Columbia Drive (Route 15),
- Roswell Road (Route 5),
- MLK Jr. Drive west of H.E. Holmes Station (Route 73),
- Memorial Drive east of I-285 (Route 121).

Some high-ridership stops without seating correspond to MARTA rail stations. Some bus bays at rail stations lack seating (e.g. North Avenue, Midtown). A number of surveyed stops with high ridership away from rail stations have no seating, and may correspond to stops where many passengers exit the bus:

- North Lake Mall (Routes 30, 125, 126),
- ATL Airport, International Arrivals (Route 191),
- Forest Cove Apartments (McDonough Boulevard in Thomasville) (Route 49),
- Old Dixie Road at Brecken Ridge Road (Route 192),
- Panthersville Road at Bouldercrest Road (end of Route 15).

Figure 21 | Map of surveyed bus stops with vs. without seating.



## Shelter

Over 88% of bus stops surveyed have no shelter. Bus stops with no shelter account for 64% of the average weekly ridership. Although bus stops with shelters only make up 12% of all stops surveyed, these stops account for 36% of the average weekly ridership. The percentage of shelters for bus stops surveyed is slightly higher than the actual average of 9%, calculated from the bus stop and shelters totals in MARTA's FY2020 Financial Report.<sup>31</sup> This is due to the focus on higher ridership routes where bus shelters are more likely to be found. Table 4 summarizes the presence of shelters at bus stops surveyed.

**Table 4** | Number of surveyed stops with and without shelter, and affected ridership.

Answer	Count of Bus Stops	Percent of Total Stops (N = 3,248)	Total Avg. Weekly Ridership	Percent of Total Avg. Weekly Ridership
Yes	398	12%	248,031	36%
No	2,850	88%	434,454	64%

The location of surveyed stops with vs. without shelter is shown in Figure 22. Note that the stop markers on the map do not include direction of travel (e.g. Northbound vs. Southbound).

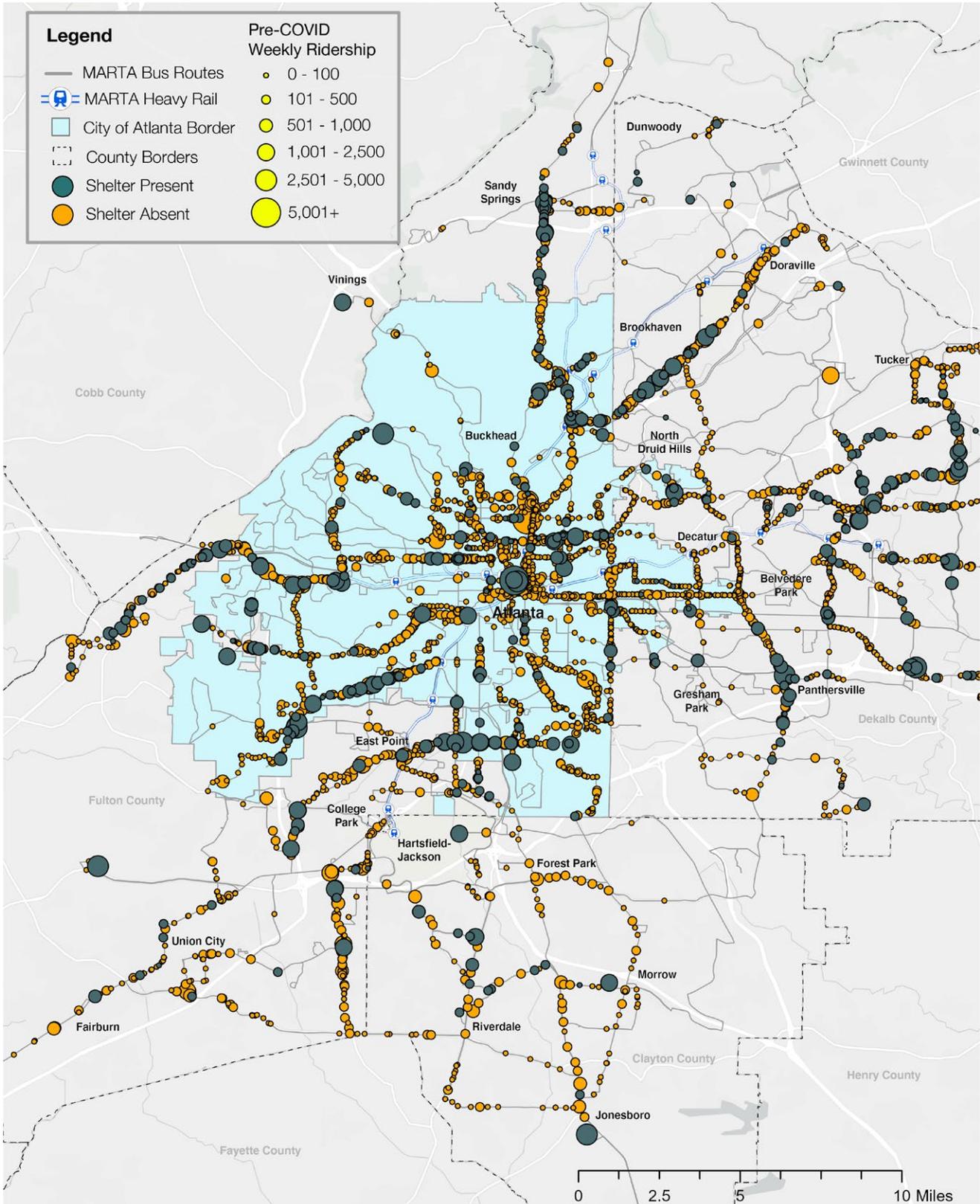
Many surveyed stops with comparatively high-ridership (pre-COVID-19), denoted with large dark dots, already have a shelter. Shelter location follows a pattern similar to the locations of benches, however the shelters appear more scattered because of their relatively low number.

Some high-ridership stops without shelter correspond to MARTA rail stations, where some bus bays do not offer full shelter (e.g. Midtown, or the drop-off-only stop on Arts Center Way), although there are fully

sheltered locations nearby within the station. A number of surveyed stops with high ridership away from rail stations have no shelter, and may correspond to stops where many passengers exit the bus:

- North Lake Mall (Routes 30, 125, 126),
- Forest Cove Apartments (McDonough Boulevard in Thomasville) (Route 49),
- Old Dixie Road at Brecken Ridge Road (Route 192),
- Old National Mall (Routes 89, 189, 195),
- Panthersville Road at Bouldercrest Road (end of Route 15).

Figure 22 | Map of surveyed bus stops with vs. without shelter.



## Trash Can

Nearly 30% of bus stops surveyed have a trash can. These bus stops account for over half of the average weekly ridership. The remaining 70% of bus stops without trash cans carry less than 46% of the average weekly ridership. Table 5 summarizes the availability of trash cans at the bus stops surveyed.

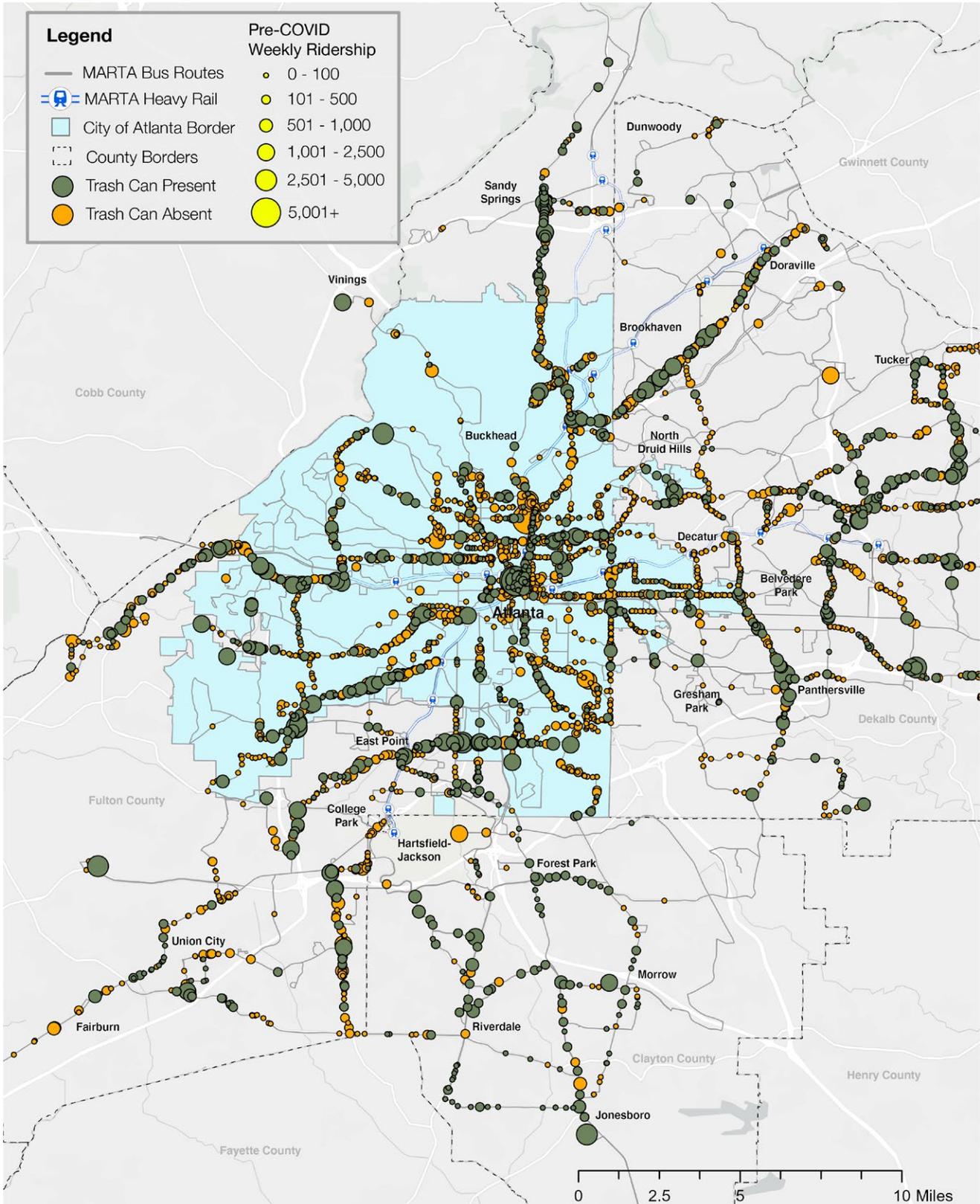
**Table 5** | Number of surveyed stops with and without trash cans, and affected ridership.

Answer	Count of Bus Stops	Percent of Total Stops (N = 3,248)	Total Avg. Weekly Ridership	Percent of Total Avg. Weekly Ridership
Yes	937	29%	368,183	54%
No	2,311	71%	314,301	46%

The location of surveyed stops with vs. without trash cans is shown in Figure 23. Note that the stop markers on the map do not include direction of travel (e.g. Northbound vs. Southbound).

Many surveyed stops with comparatively high-ridership (pre-COVID-19), denoted with large dark dots, already have trash cans. Trash can location follows a pattern very similar to the locations of benches. More stops are equipped with trash cans than benches because trash containers cost less than seating.

Figure 23 | Map of surveyed bus stops with vs. without trash cans.



## Cleanliness

The most common cleanliness issue reported at bus stops by a big margin was “Litter,” which was reported at 14% of bus stops surveyed (Table 6). Following litter was “Overflowing or poorly maintained trash can” at 3% and “Dirty seating area” and “Other” at 2%. Because many of the surveys were conducted remotely without the ability to confirm if issues seen on Google Street View were one-off or persistent, it is likely cleanliness issues are underrepresented in the data.

**Table 6** | Number of surveyed stops with and without trash cans, and affected ridership.

Cleanliness Issue	Count of Surveys	Percent of Total Stops (N = 3,421)
Litter	483	14%
Graffiti	40	1%
Overflow	87	3%
Dirty Seating Area	53	2%
Other	72	2%

### Litter at Bus Stops with Trash Cans

For the bus stops where litter was reported as a cleanliness issue, 61% of them do not have a trash can (Table 7). This figure shows that such litter issues could be mitigated by adding trash cans. Also, nearly 40% of bus stops surveyed with a litter issue also have trash cans. This is also indicative of an opportunity to improve the maintenance of trash cans at bus stops.

**Table 7** | Distribution of trash cans among surveyed stops with litter issues.

Trash Can	Count of Surveys	Percent of Total Stops (N = 483)
Yes	187	39%
No	296	61%

## Line of Sight

Nearly 22% of bus stops surveyed have a line of sight obstruction that would likely require the rider to step into the roadway or lean into traffic to flag down the bus. The majority of stops (78%) have no obstructions to the line of sight from the bus operator to the bus stop boarding area (Table 8).

**Table 8** | Line of sight at surveyed stops.

Answer	Count of Surveys	Percent of Total Stops (N = 3,421)
Yes	742	22%
No	2,679	78%

## Route Number

Only 12% of the stops surveyed have route number information present at the stop (Table 9). These 12% of stops account for nearly 40% of the average weekly ridership. A large majority of riders board the bus at stops without any route numbers.

**Table 9** | Number of surveyed stops displaying bus route numbers, and affected ridership.

Answer	Count of Bus Stops	Percent of Total Stops (N = 3,248)	Total Avg. Weekly Ridership	Percent of Total Avg. Weekly Ridership
Yes	399	12%	262,786	39%
No	2,849	88%	419,699	61%

## Route Schedule

The presence of route schedules follows a similar distribution to route numbers, only less common. Bus stops with a route schedule make up 10% of the bus stops surveyed and 30% of the average weekly ridership (Table 10).

**Table 10** | Number of surveyed stops displaying route schedules, and affected ridership.

Answer	Count of Bus Stops	Percent of Total Stops (N = 3,248)	Total Avg. Weekly Ridership	Percent of Total Avg. Weekly Ridership
Yes	340	10%	207,393	30%
No	2,908	90%	475,092	70%

## Route Map

Route maps are equally uncommon among the bus stops surveyed, accounting for just 10% of the total stops and nearly 30% of the average weekly ridership (Table 11).

**Table 11** | Number of surveyed stops displaying route maps, and affected ridership.

Answer	Count of Bus Stops	Percent of Total Stops (N = 3,248)	Total Avg. Weekly Ridership	Percent of Total Avg. Weekly Ridership
Yes	337	10%	200,925	29%
No	2,911	90%	481,560	71%

## Wayfinding

Only 9.4% of bus stop surveys reported full route information (route numbers, route schedule, map and customer service contact information) at the stop. An example of a surveyed stop with full route information is pictured in Figure 24 below. The bus stops where this was reported accounted for 27% of the average weekly ridership. Another 3.6% of bus stops have some wayfinding information (at least one piece of wayfinding information but not all) accounting for another 13% of the average weekly ridership.

**Figure 24** | Bus stop with all route information and customer service information available (Source: Google Street View).



87% of bus stops surveyed have no wayfinding information outside of the Customer Service telephone number. These stops account for 60% of the average weekday ridership. Table 12 and Figure 25 summarize the presence of wayfinding information at bus stops surveyed.

**Table 12** | Wayfinding levels at surveyed stops, and affected ridership.

Answer	Count of Bus Stops	Percent of Total Stops (N = 3,248)	Total Avg. Weekly Ridership	Percent of Total Avg. Weekly Ridership
<b>All Route Info and Customer Service Information</b>	304	9%	185,727	27%
<b>Some Route Info and Customer Service Information</b>	126	4%	405,987	13%
<b>Customer Service Only</b>	2,818	87%	90,770	60%



The location of surveyed stops with vs. without wayfinding present is shown in Figure 25. Note that the stop markers on the map do not include direction of travel (e.g. Northbound vs. Southbound).

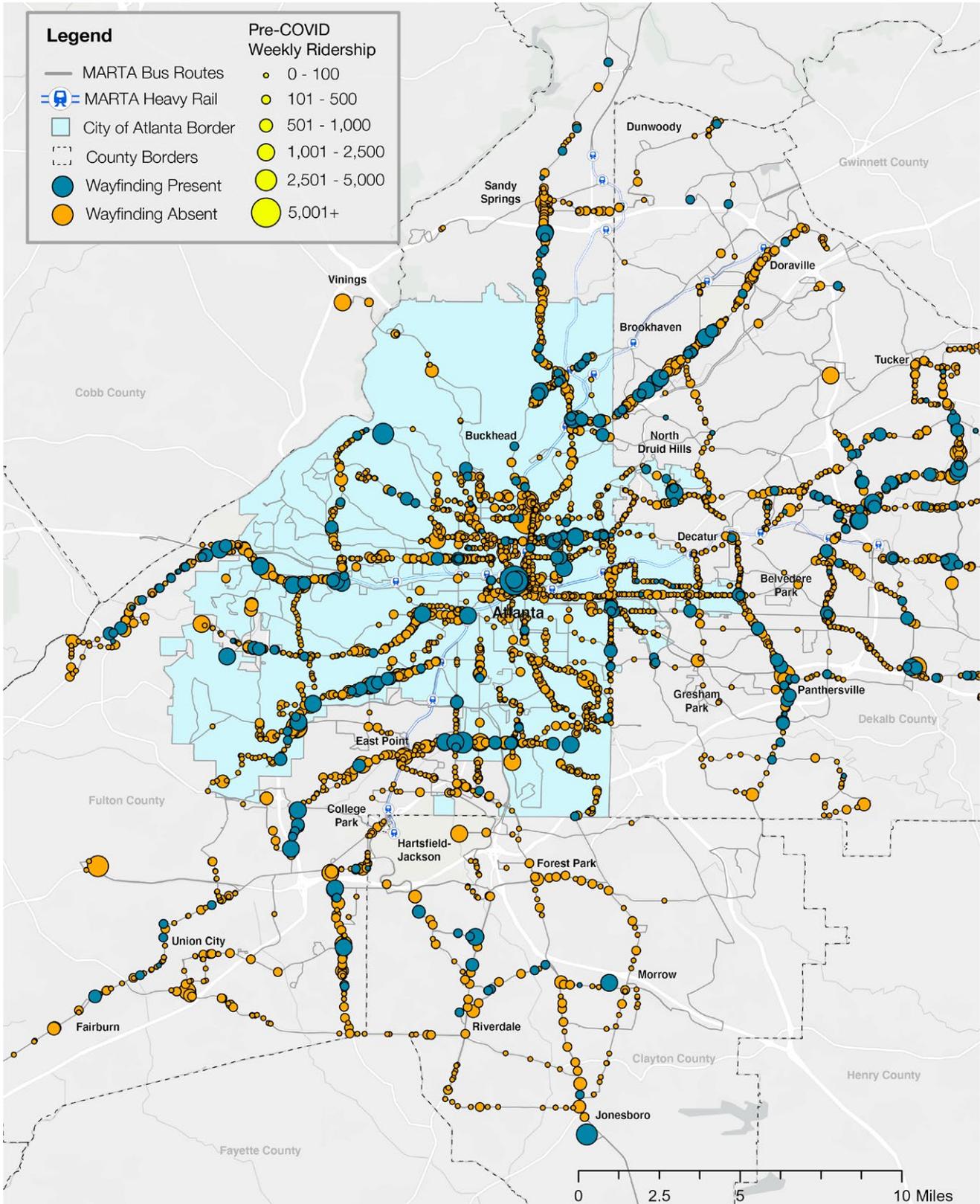
The map of bus stops with and without accessible wayfinding looks similar to Figure 22 displaying surveyed bus stops with vs. without shelter. This is because nearly all wayfinding information available at MARTA bus stops is found at stops with shelters.

Thus, a number of surveyed stops with high ridership with no shelters are also stops with no wayfinding information:

- North Lake Mall (Routes 30, 125, 126),
- Forest Cove Apartments (McDonough Boulevard in Thomasville) (Route 49),
- Old Dixie Road at Brecken Ridge (Route 192),
- Old National Mall (Routes 89, 189, 195),
- Panthersville Road at Bouldercrest Road (end of Route 15).

It is also worth noting how wayfinding information is largely missing from bus stops in the Downtown and Midtown Atlanta neighborhoods. For a pedestrian passing by a bus stop, there is no way to tell when the bus is coming, where it's going, and for what parts of the day and days of the week it runs. In these high density neighborhoods where people are more likely to use transit, wayfinding information is a necessary feature to help make the bus network easy to understand and use.

Figure 25 | Map of surveyed bus stops with vs. without wayfinding.



## Wayfinding at Non-Sheltered Bus Stops

Wayfinding is most likely found at bus stops with shelters. Maps from Figures 22 and 25 are indeed very similar. Per Table 13, out of the 304 bus stops surveyed with all wayfinding information reported present, only 7% are bus stops without shelters. This is in stark contrast to the bus stops surveyed with only some wayfinding information reported. Bus stops without a shelter make up 58% of the bus stops surveyed with only some wayfinding information. This is due to the types of wayfinding available at MARTA bus stops. Shelters are designed to have complete wayfinding information. In contrast, bus stops without shelters usually only support an additional sign attached to the bus stop marker with route numbers.

**Table 13** | Wayfinding levels at surveyed stops.

Availability of route information and customer service information	Count of Bus Stops	Count of Bus Stops Without Shelter	Percentage of Total Stops
<b>Complete</b>	304	20	7%
<b>Partial</b>	126	73	58%

## Wayfinding Accessibility

Of the 430 bus stops surveyed that have some wayfinding information, less than 10% of these stops have this information located at the eye level of a person using a wheelchair. Wayfinding accessibility is summarized in Table 14 and Figure 26.

**Table 14** | Wayfinding accessibility at surveyed stops, and affected ridership.

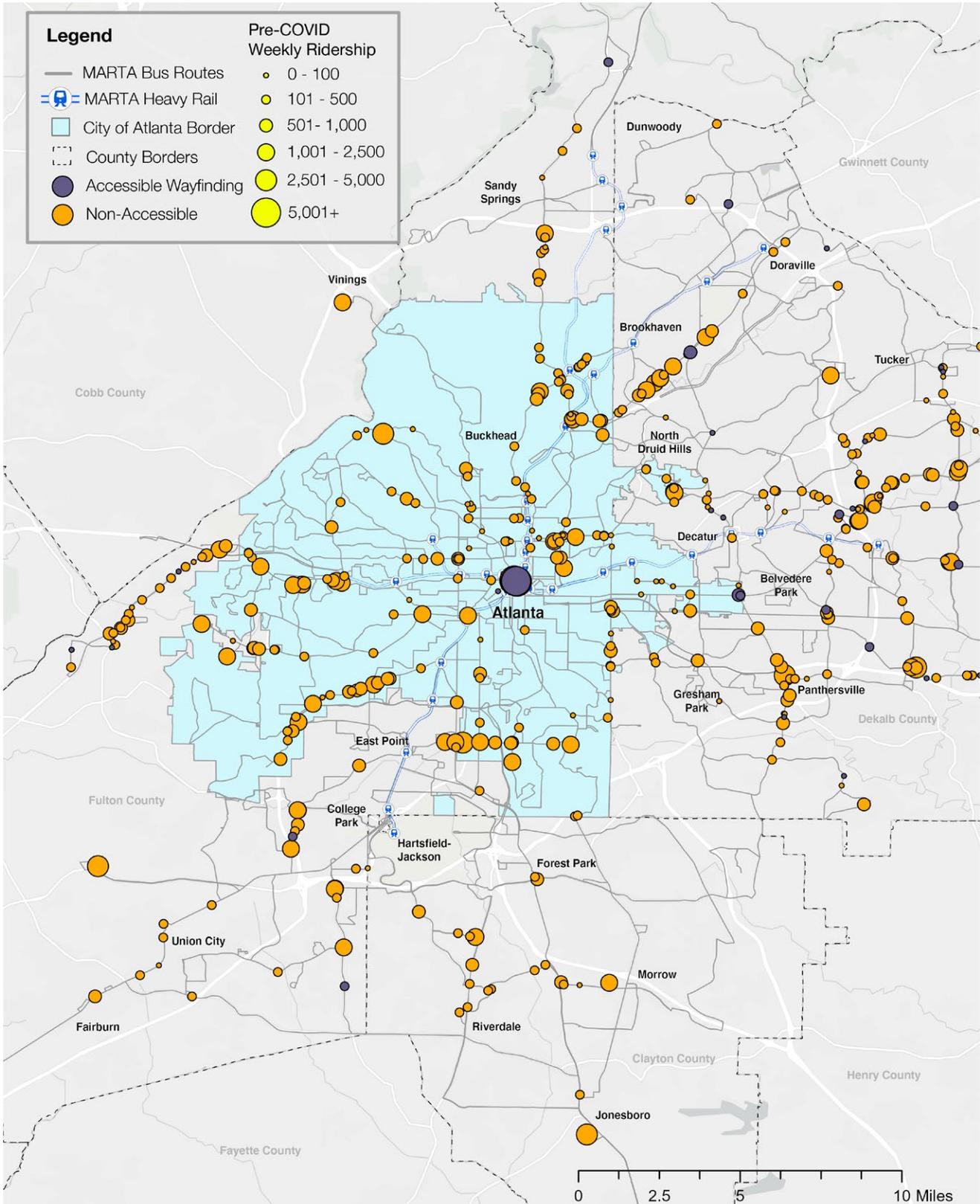
Answer	Count of Bus Stops	Percent of Total Stops (N = 3,248)	Total Avg. Weekly Ridership	Percent of Total Avg. Weekly Ridership
<b>Wayfinding Accessible</b>	35	1%	15,235	2%
<b>Wayfinding Not Accessible</b>	395	12%	261,173	38%
<b>No Wayfinding</b>	2,818	87%	405,987	60%

The location of surveyed stops with vs. without accessible wayfinding is shown in Figure 26. Note that the stop markers on the map do not include direction of travel (e.g. Northbound vs. Southbound).

The map of bus stops with and without accessible wayfinding looks similar to Figure 22 displaying surveyed bus stops with vs. without shelter. This is because in nearly all cases, the only wayfinding information provided at MARTA bus stops is at stops with shelters and as stated above, the design of shelter wayfinding information is inaccessible due to high positioning and insufficient font size and contrast.

Bus stops with shelters are high ridership stops, usually near important destinations like employment centers, healthcare facilities, and grocery stores. Thus, high ridership corridors like Buford Highway and Campbellton Road contain many bus stops with inaccessible wayfinding information.

**Figure 26 |** Map of surveyed bus stops with wayfinding at eye level.



## Lighting

A quarter (24%) of bus stops surveyed have some lighting present. Bus stops with lighting present account for 33% of the average weekly ridership. Lighting is summarized in Table 15.

**Table 15** | Lighting at surveyed stops.

Survey Response	Count of Surveys	Percent of Total Stops (N = 3,421)
<b>Lighting Present</b>	813	24%
<b>No Lighting</b>	1,124	33%
<b>N/A</b>	1,484	43%

## Sidewalk

Nearly 70% of reported bus stops have a sidewalk present in both directions. These bus stops account for over 80% of the average weekly ridership. A sidewalk is present in only one direction in 7% of reported bus stops. Almost a quarter of reported bus stops have no sidewalk in either direction (Figure 27). These sidewalk-less bus stops represent 11% of the average weekly ridership. The findings are summarized in Table 16 and Figure 28.

**Table 16** | Sidewalk availability at surveyed stops, and affected ridership.

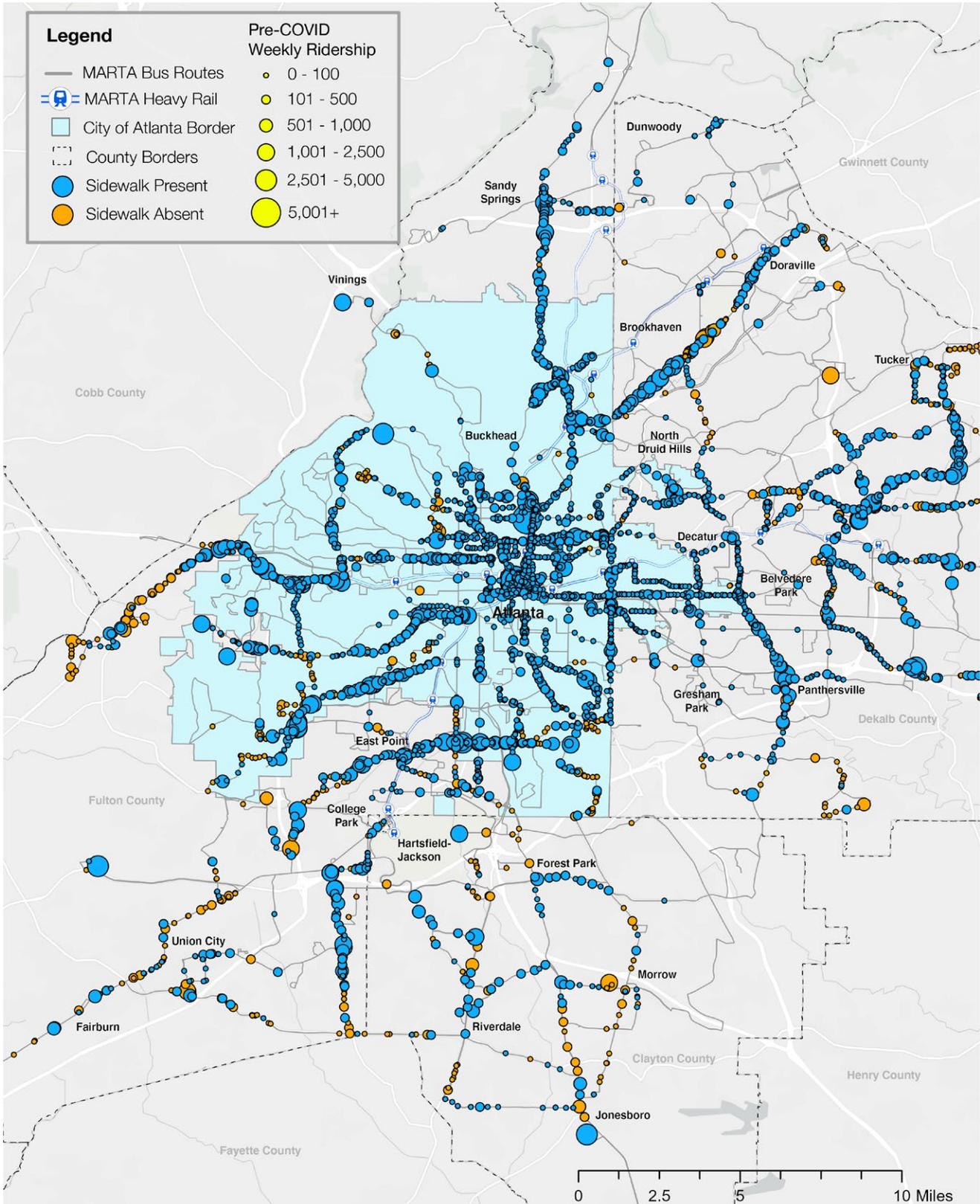
Answer	Count of Bus Stops	Percent of Total Stops (N = 3,248)	Total Avg. Weekly Ridership	Percent of Total Avg. Weekly Ridership
<b>Sidewalk Present in Both Directions</b>	2,241	69%	562,089	82%
<b>Sidewalk Present in One Direction</b>	212	7%	44,568	7%
<b>No Sidewalk</b>	795	25%	75,827	11%

**Figure 27** | Bus stop with all the desirable amenities...except for the sidewalk (Google Street View)



The map in Figure 28 illustrates the extensive sidewalk coverage of the majority of surveyed bus stops. Bus stops without a sidewalk are dispersed throughout the service area with some clusters in the City of Atlanta, Clayton, DeKalb, and Fulton County. This includes the section of Route 73 in Fulton County along Fulton Industrial Boulevard, Route 4 in the Leila Valley neighborhood in Atlanta, portions of Routes 192, 193, and 194 in Clayton County, and the section of Route 39 as it enters Chamblee.

Figure 28 | Map of sidewalks at surveyed bus stops.



## Obstacles

Over half (58.1%) of bus stops surveyed reported no obstacles present on the path to or at the stop that might limit the mobility of a person using a mobility device or stroller. The remaining 41% of bus stops had some obstacle present (Table 17). These obstacles include tree stumps, parked cars, construction signs, utility poles, uneven sidewalks, no sidewalks, overgrown grass or trees, no curb cuts, and more (Figure 29).

**Table 17** | Obstacles at surveyed stops.

Survey Response	Count of Surveys	Percent of Total Stops (N = 3,421)
<b>Obstacles Present</b>	1,414	41%
<b>No Obstacles Present</b>	2,007	59%

**Figure 29** | Examples of sidewalk obstacles: Left, construction sign (Google Street View). Right: damaged sidewalk.



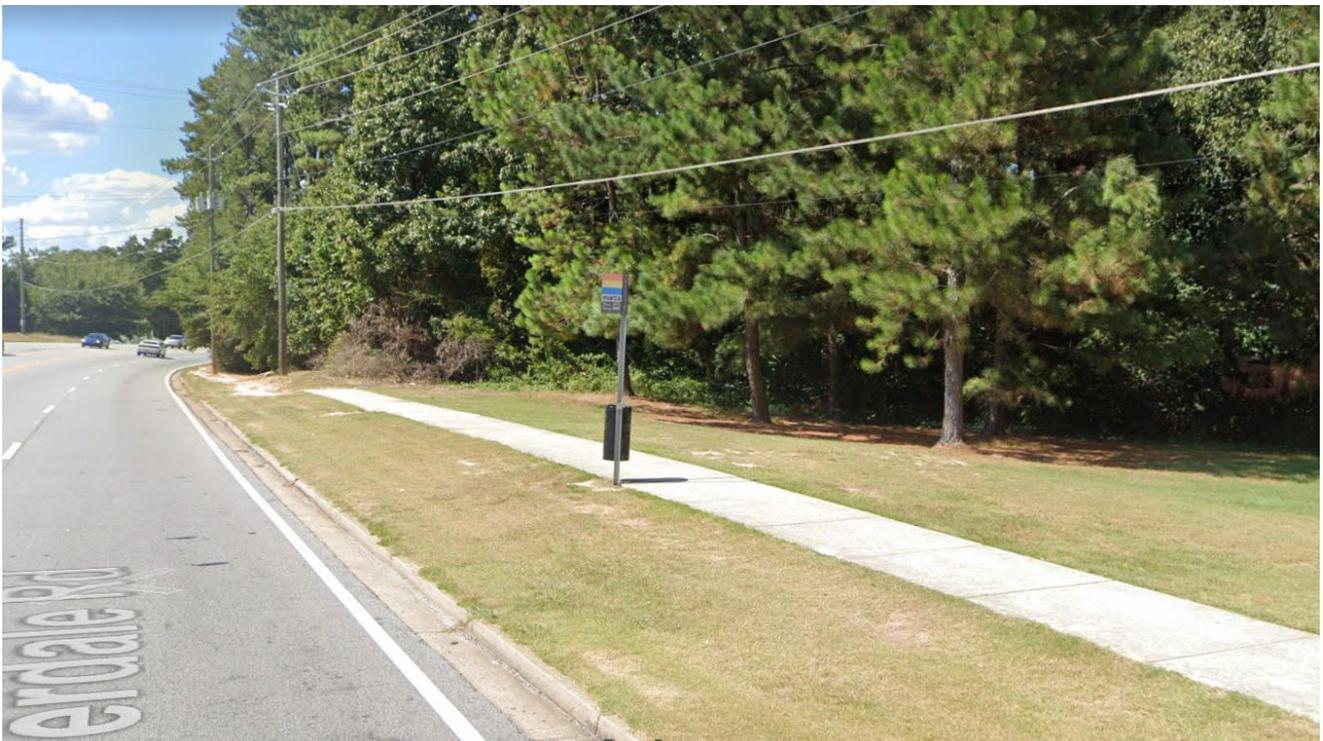
## Boarding Area

In the majority of bus stops surveyed (68%), the surface of the boarding area is made of concrete. These stops account for 83% of the average weekly ridership. A grass or dirt boarding area is present at 27% of the total stops surveyed which account for 10% of the average weekly ridership (Table 18). Note that the boarding area for the bus stop can be unpaved even if there is a paved sidewalk leading to the bus stop (Figure 30).

**Table 18** | Boarding areas at surveyed stops, and affected ridership.

Answer	Count of Bus Stops	Percent of Total Stops (N = 3,248)	Total Avg. Weekly Ridership	Percent of Total Avg. Weekly Ridership
Concrete sidewalk	2,214	68%	566,029	83%
Grass or dirt	885	27%	70,692	10%
Asphalt	28	1%	7,177	1%
Brick pavers	109	3%	37,596	6%
Gravel	12	0%	810	0%

**Figure 30** | Example of a bus stop with a sidewalk and a grass (unpaved) boarding area (Google Street View).



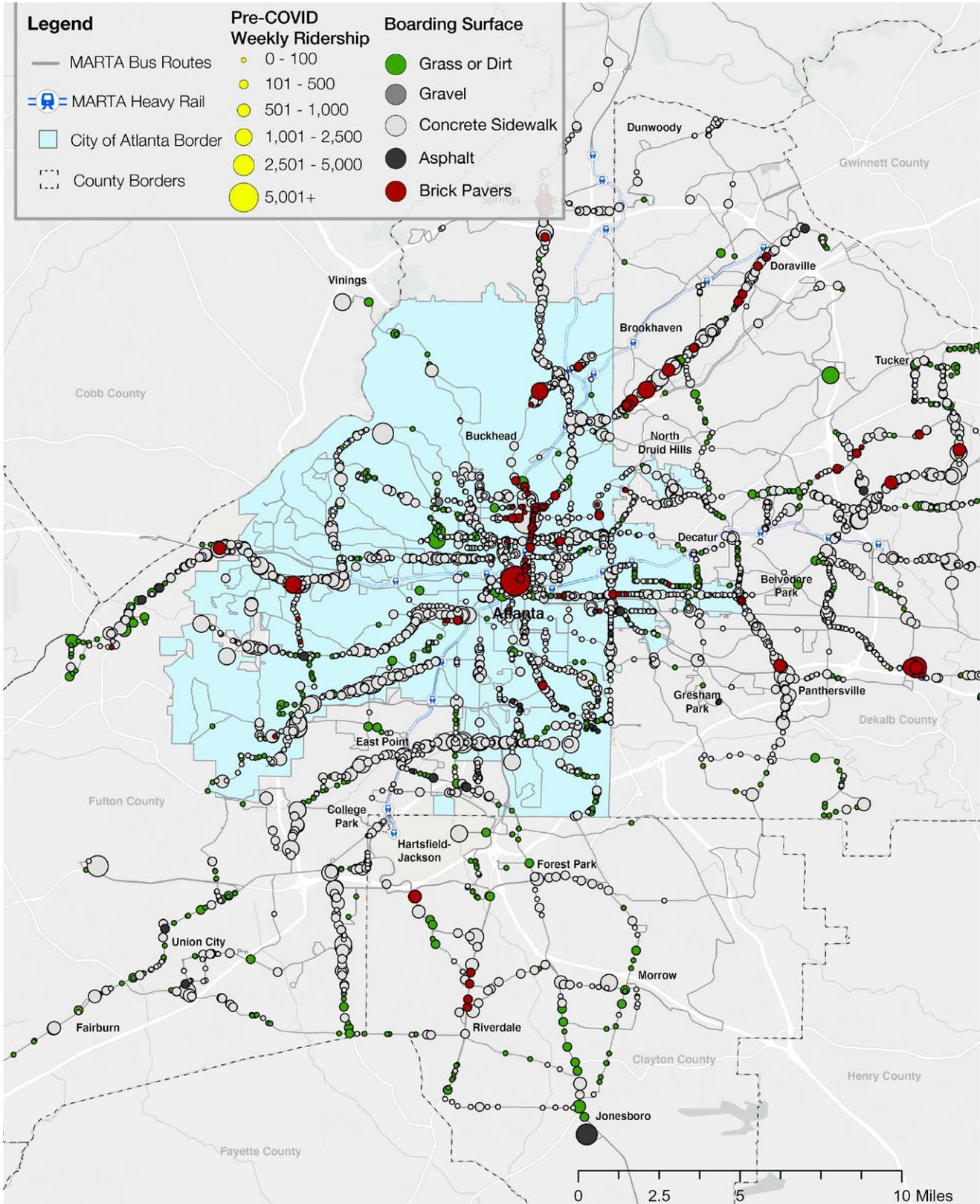


Although concrete sidewalk boarding areas were prevalent among the bus stops surveyed, the boarding area was recorded as grass or dirt in several neighborhoods and route segments. Figure 32 depicts bus stops with grass or dirt boarding areas in green.

Some routes have extended segments where bus stops don't have a paved boarding area, generally outside of the Atlanta city limits in less densely populated areas of the MARTA Service counties. These segments include Route 73 in Fulton County along Fulton Industrial Boulevard, Route 180 along Roosevelt Highway in South Fulton, Route 86 as it traverses South DeKalb, and Route 17 along Rockbridge Road in DeKalb County.

However, there exists within the Atlanta city limits several route segments where the bus stops do not have a paved boarding area. These segments include Route 55 in the South River Gardens neighborhood, Route 24 along Hosea L. Williams Drive, and Route 71 along Cascade Road.

Figure 31 | Map of boarding areas at surveyed bus stops.



## Crosswalk Summary

Almost half (47%) of surveyed bus stops do not have any crosswalks within 100 feet of the stop. These stops account for 33% of the average weekly ridership on the system. Only 33% of surveyed bus stops have both a crosswalk on the main street and cross street present. Over 40% of surveyed bus stops have a crosswalk on the main street and 56% of the average weekly ridership occurs at bus stops with at least one painted crosswalk available to cross the street the bus is traveling on at the location of the stop. The findings are summarized in Table 19 and Figure 32.

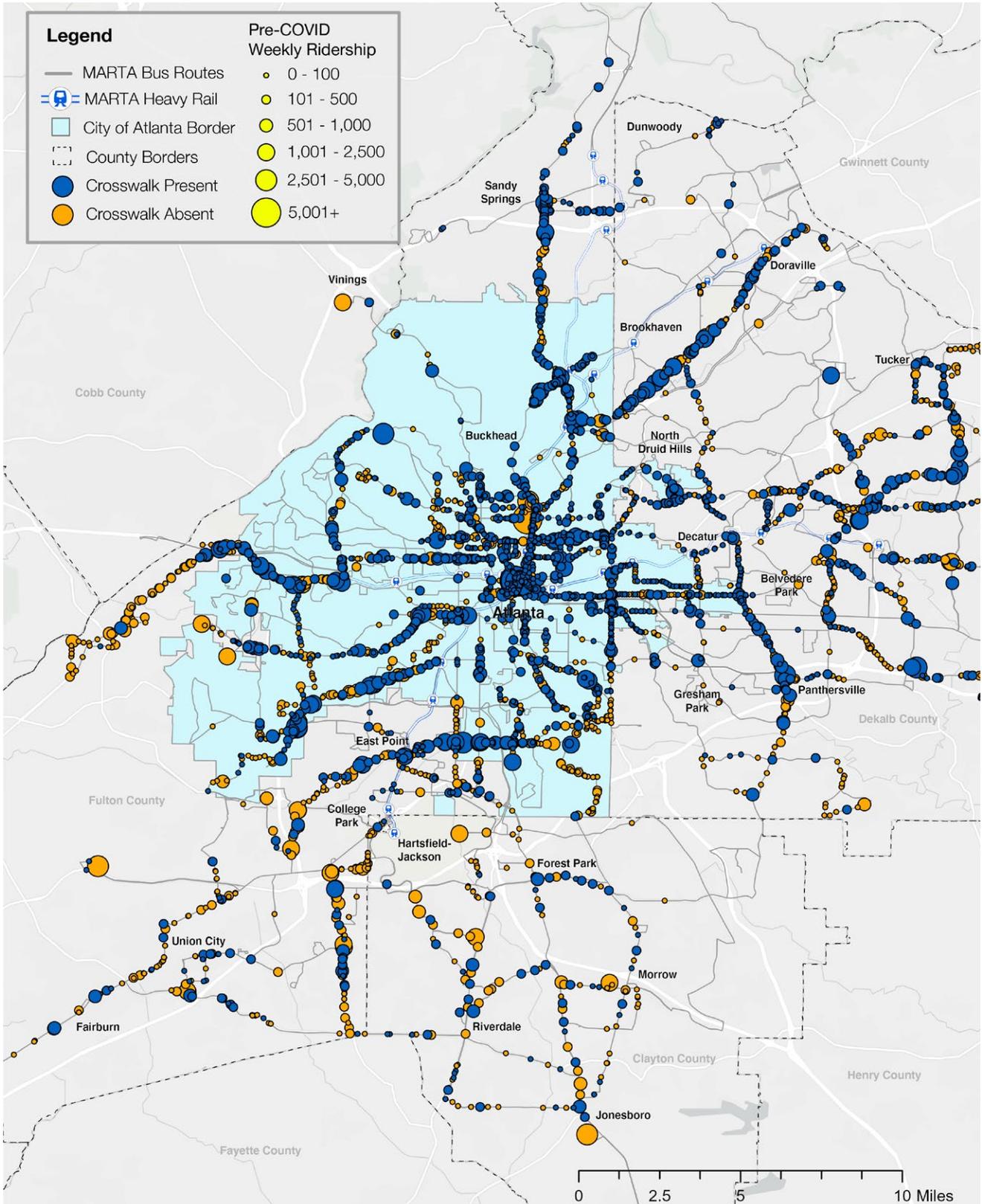
**Table 19** | Crosswalks at surveyed stops, and affected ridership.

Answer	Count of Bus Stops	Percent of Total Stops (N = 3,248)	Total Avg. Weekly Ridership	Percent of Total Avg. Weekly Ridership
<b>Crosswalk on Cross Street</b>	370	11%	73,676	11%
<b>Crosswalk on Main Street</b>	300	9%	58,927	9%
<b>Crosswalk on Cross Street and Main Street (Figure 32a)</b>	1064	33%	323,615	47%
<b>No Crosswalk (Figure 32b)</b>	1514	47%	226,268	33%

**Figure 32** | (a) Left: Example of a bus stop with a main street and cross street crosswalk within 100 feet. The crosswalk also has a traffic light, curb cuts, and tactile guide strips; (b) Right: Example of a bus stop with no main street crosswalk within 100 feet of the stop (Source: Google Street View)



Figure 33 | Map of crosswalks at surveyed bus stops.



The location of surveyed stops with vs. without crosswalks is shown in Figure 33. The majority of stops without crosswalks are generally as follows:

**Outside of I-285, where most stops are on suburban highways, especially in:**

- Eastern DeKalb County (on Routes 86, 116, 116, 117, 120),
- Western Fulton County on Fulton Industrial Boulevard (Route 73), Cascade Road (Route 71), and Roosevelt Highway (Route 180),
- Most of Clayton County.

**Inside I-285, on collector roads and highways in:**

- Hapeville (Routes 55, 172, 193),
- East Point, on Washington Road (Routes 84, 181),
- Sandy Springs, on Roswell Road (Route 5),
- City of Atlanta, on Holmes Drive (Route 60), Lynhurst Drive (Route 66), Metropolitan Parkway (Route 95), Flat Shoals Road (Route 74) and McDonough Boulevard (Route 49).

Some bus stops at the beginning or end of a route also don't have crosswalks and stand out in the map. This is because these are the major origins and destinations for transit riders, and in many cases, they serve enclaves tucked away from general traffic, such as subdivisions or transfer centers. Examples include Route 71 at Country Squire Apartments and the Justice Center Bus Station in Clayton County.

Some bus stops only stop on one side of the street and serve a specific destination. One bus stop in the Derrick Industrial Park off of South Fulton Parkway has no main street crosswalk because the bus picks up riders only on the side of the street where the Walmart Fulfillment and Distribution Center is located. The other side of the street is a wooded area, thus no crosswalk is needed. The same situation applies to the Airport's International Terminal on Route 191.

## Traffic Lights

Traffic lights are present at 35% of the bus stops surveyed, accounting for half of the average weekly ridership. The remaining 65% of stops without a traffic light carry the remaining half of the ridership (Table 20).

**Table 20** | Traffic lights at surveyed stops, and affected ridership.

Answer	Count of Bus Stops	Percent of Total Stops (N = 3,248)	Total Avg. Weekly Ridership	Percent of Total Avg. Weekly Ridership
Yes	1,126	35%	339,302	50%
No	2,122	65%	343,183	50%

## Curb Cuts

Curb cuts are present at more than half of the bus stops surveyed. These bus stops account for 64% of the average weekly ridership. The remaining 45% of bus stops surveyed that do not have curb cuts present at nearby crosswalks account for 36% of the average weekly ridership. The findings are summarized in Table 21 and Figure 34.

**Table 21** | Curb cuts at surveyed stops, and affected ridership.

Answer	Count of Bus Stops	Percent of Total Stops (N = 3,248)	Total Avg. Weekly Ridership	Percent of Total Avg. Weekly Ridership
Yes	1,775	55%	439,456	64%
No	1,473	45%	243,026	36%

The location of surveyed stops with vs. without curb cuts is shown in Figure 34. Note that the stop markers on the map do not include direction of travel (e.g. Northbound vs. Southbound).

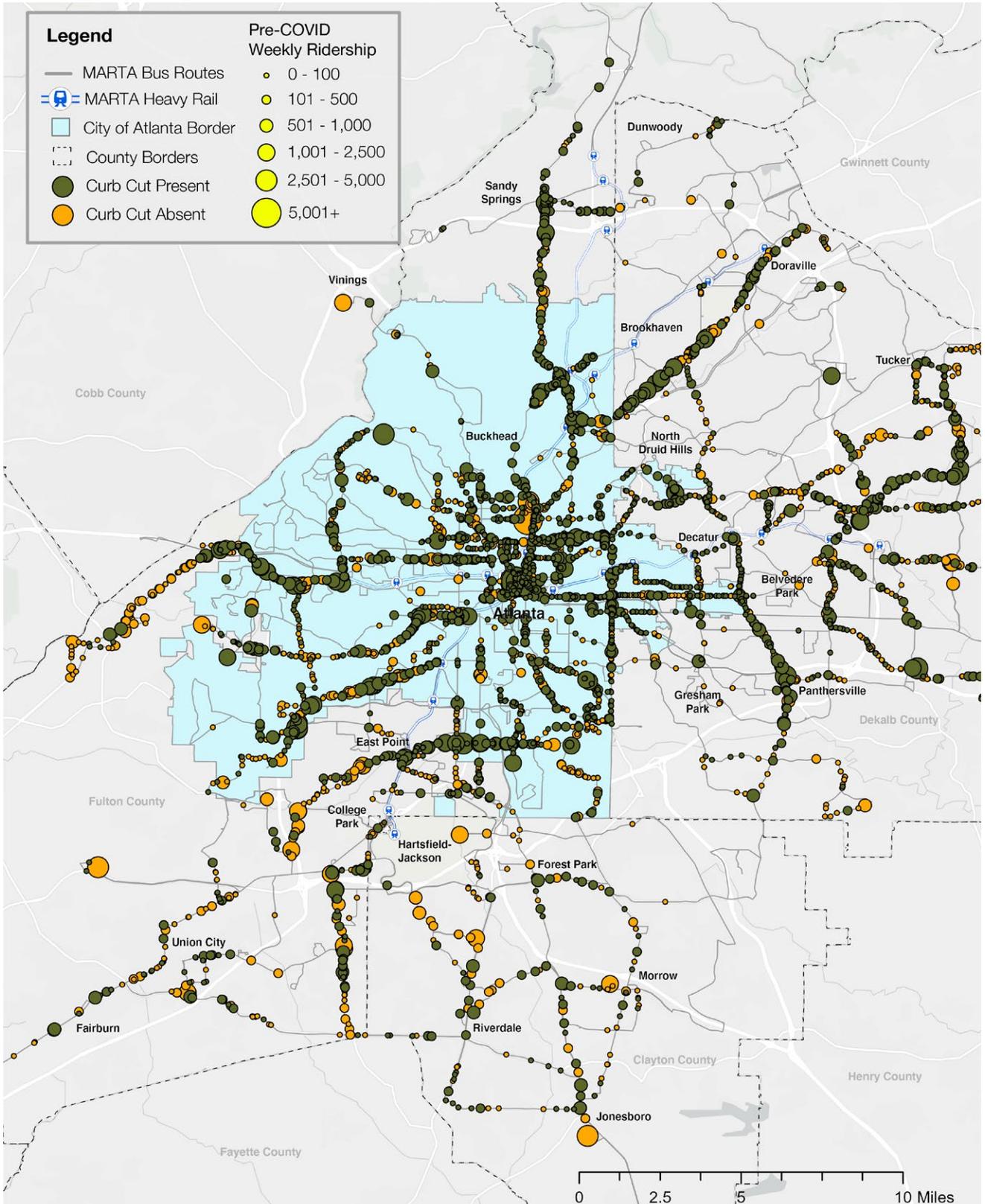
The medium to low ridership bus stops without curb cuts displayed in Figure 34 are located on portions of streets with few marked crosswalks, and thus, without the curb cuts to accompany them. Route 73 along Fulton Industrial Boulevard at the western edge of Fulton County is one example. Fulton Industrial Boulevard is a four lane divided highway with plenty of gaps in the sidewalk network and long distances between marked crossings. Due to the lack of designated crossing areas and sidewalks along the segment of Fulton Industrial Boulevard that Route 73 travels on, there is a noticeable absence of curb cuts. Other areas with bus stops and similar characteristics include:

- East Ponce de Leon Avenue around Clarkston (Route 120),
- Sylvan Hills south of Lakewood-Ft. McPherson Station (Route 172),
- Washington Road/Camp Creek Marketplace (Route 181),
- Garden Walk Boulevard (Route 196).

Bus stops at the beginning or end of a route without curb cuts also stand out in the map. This is because these are the major origins and destinations for transit riders. Examples include Route 71 at Country Squire Apartments and the Justice Center Bus Station in Clayton County.

As discussed in the Crosswalk Summary subsection, some bus stops only stop on one side of the street and serve a specific destination, thus no curb cut is needed.

Figure 34 | Map of curb cuts at surveyed bus stops.



## Crosswalk Signals

Most bus stops (71%) surveyed lack any crossing signals at a nearby crosswalk. Although only 29% of the bus stops surveyed have a nearby crosswalk, they account for 43% of the average weekly ridership. The findings are summarized in Table 22 and Figure 35.

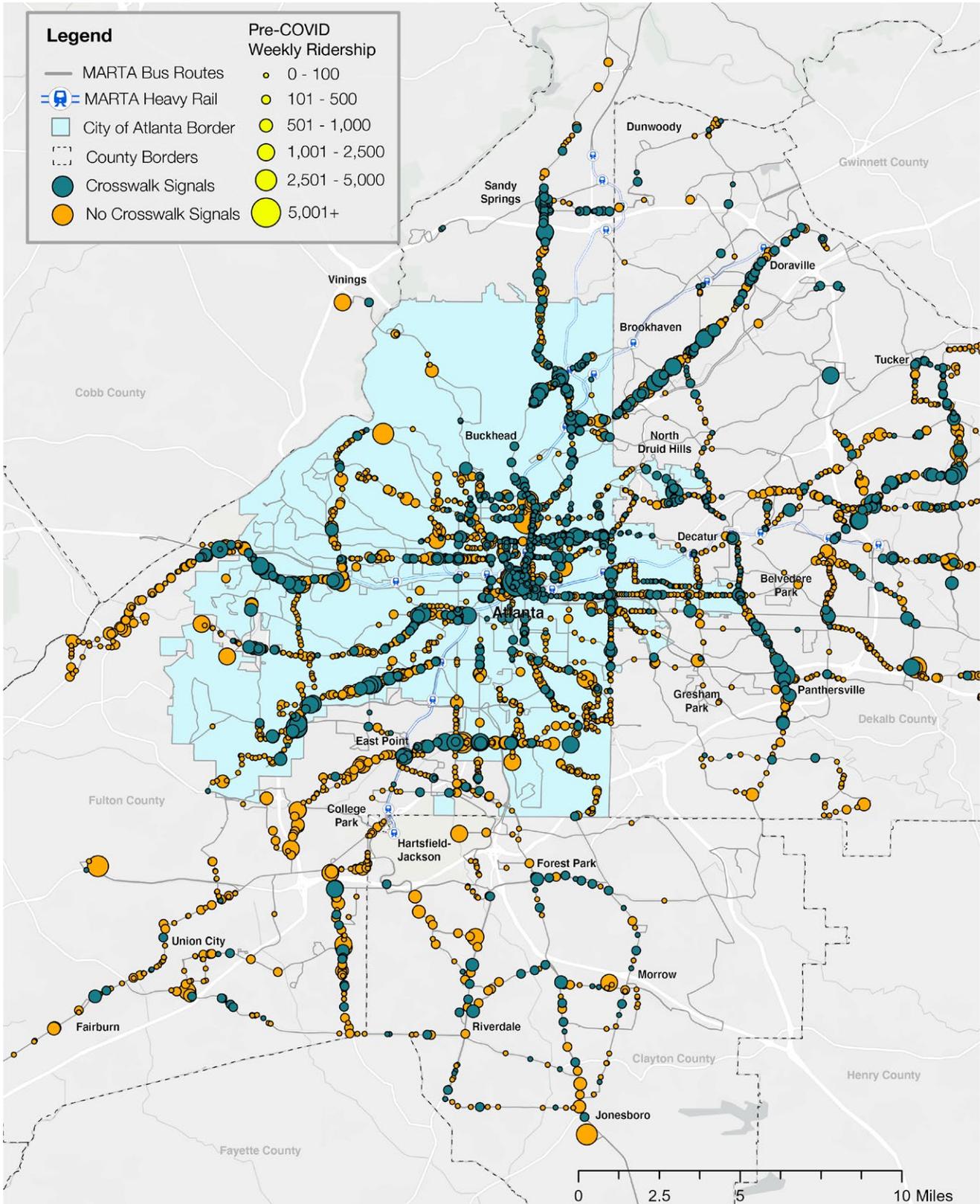
**Table 22** | Crosswalk signals at surveyed stops, and affected ridership.

Answer	Count of Bus Stops	Percent of Total Stops (N = 3,248)	Total Avg. Weekly Ridership	Percent of Total Avg. Weekly Ridership
Yes	943	29%	292,674	43%
No	2,305	71%	389,810	57%

The location of surveyed stops with vs. without crosswalk signals is shown in Figure 35. Note that the stop markers on the map do not include direction of travel (e.g. Northbound vs. Southbound).

The bus stops that lack traffic signals coincide with areas where there is not a marked crosswalk. These areas overlap with those lacking curb cuts and are described in the Curb Cuts section.

Figure 35 | Map of crosswalk signals at surveyed bus stops.



## Tactile Guide Strips

ADA Tactile guide strips are the second most common crossing infrastructure found among bus stops surveyed at 40% of total stops. In total, bus stops surveyed with tactile guide strips account for 56% of the average weekly ridership. Although the majority of bus stops surveyed lack tactile guide strips, it accounts for less than half (44%) of the average weekly ridership. The findings are summarized in Table 23 and Figure 36.

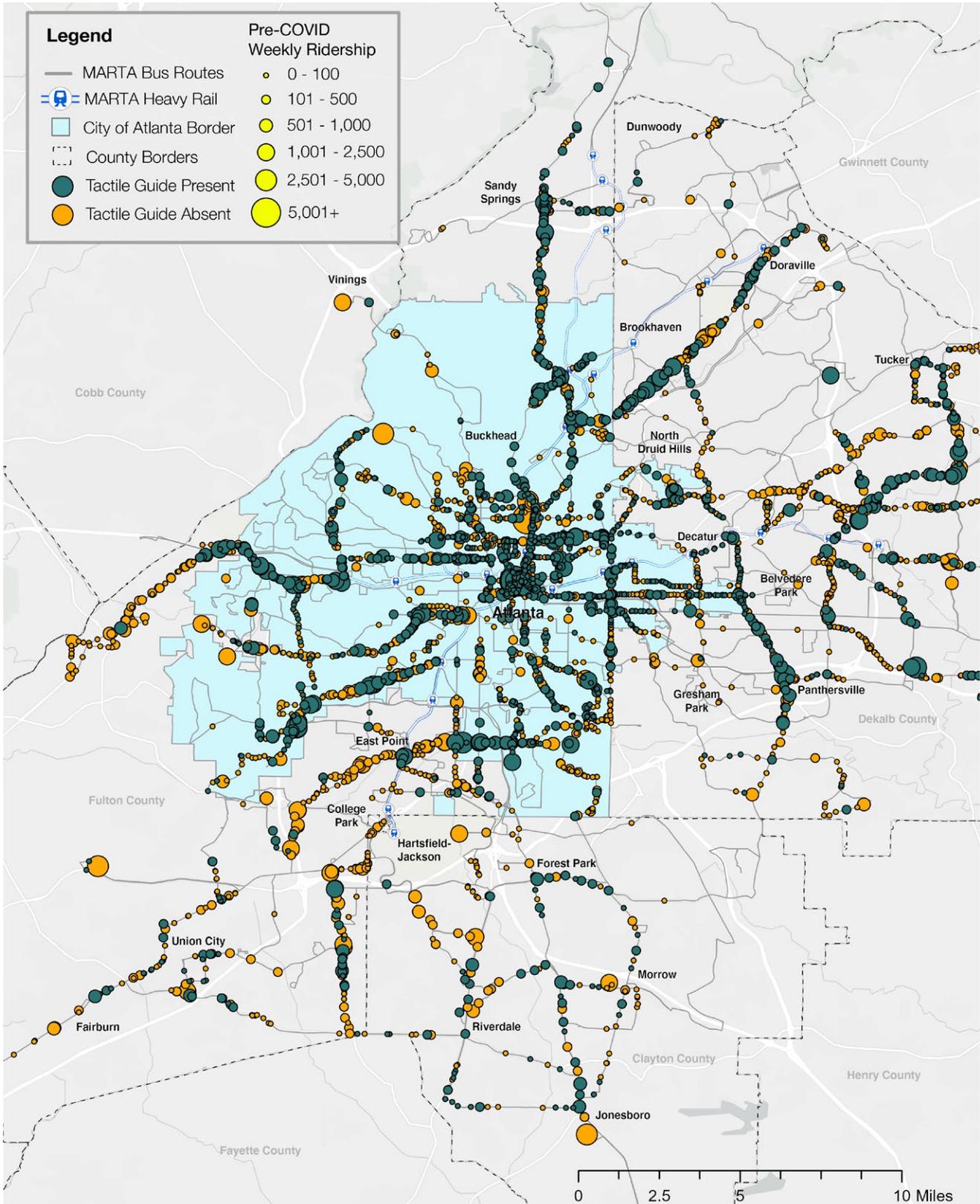
**Table 23** | Tactile guide strips at surveyed stops, and affected ridership.

Answer	Count of Bus Stops	Percent of Total Stops (N = 3,248)	Total Avg. Weekly Ridership	Percent of Total Avg. Weekly Ridership
Yes	1,308	40%	384,777	56%
No	1,940	60%	297,708	44%

The location of surveyed stops with vs. without tactile guide strips is shown in Figure 36. Note that the stop markers on the map do not include direction of travel (e.g. Northbound vs. Southbound).

The bus stops and routes that lack tactile guide strips coincide with areas where there is not a marked crosswalk. These areas overlap with the sections of street lacking curb cuts as described in the Curb Cuts section.

Figure 36 | Map of tactile guide strips at surveyed bus stops.



## Observed Behaviors

Of the surveys collected, the most prominent observed behavior was “Dangerous motorist behavior around the bus stop” which was reported in 32% of the bus stops surveyed. The next most observed behaviors were “Pedestrians crossing the roadway at mid-block locations” and “Pedestrians using informal pathways where sidewalks do not exist” trailing in at 14% and 12% respectively. Nearly half of all surveys submitted reported no observed behavior due to it being the first time the surveyor had visited the stop either in person or remotely. Behavioral observations are summarized in Table 24.

**Table 24** | Behavioral observations at surveyed stops, and affected ridership.

Answer	Count of Bus Stops	Percent of Total Stops (N = 3,421)
<b>Pedestrians using informal pathways where sidewalks do not exist</b>	423	12%
<b>Pedestrians competing for seating at the bus stop</b>	64	2%
<b>Pedestrians crossing the roadway at mid-block locations</b>	478	14%
<b>Pedestrians running across roadways to catch the bus</b>	258	8%
<b>Dangerous motorist behavior around bus stop (e.g., speeding or not yielding to pedestrians)</b>	1,102	32%
<b>None of the above (first visit to this stop)</b>	1,691	49%
<b>None of the above (occasional or frequent user of this stop)</b>	246	7%

The easily observable informal pathways can be spotted at many stops that lack sidewalks and paved boarding areas. Figure 37 below depicts a few examples from the surveyed stops where prominent dirt paths and patches have been etched into the ground as riders travel to and from the bus stop each day. The other behaviors require more time to observe at the bus stop.

**Figure 37** | Examples of various bus stops where informal pathways or waiting areas are etched into the dirt where a sidewalk or paved boarding area should be (Source: Google Street View)



## Deficient Bus Stops and Areas

An observation of the amenities maps from Figures 21-23, 25, 26, 28, and 33-36 reveals a number of bus stops, some with high ridership, consistently lacking a majority of amenities. A list of bus stops lacking amenities and their corresponding routes are summarized in Table 25.

Clusters of bus stops with at least 6 missing amenities are listed below. Improving stops such as the ones below would directly and significantly benefit the highest proportion of riders:

- Ranchwood and Weems Dr near North Lake Mall (terminus of Routes 30, 126, 133),
- ATL Airport, International Arrivals (Route 191) (Note that the stop is used for all directions of travel on this route, so a crosswalk is not necessary at this stop),
- Forest Cove Apartments in Thomasville (Route 49),
- Panthersville Road at Bouldercrest Road (Route 15 terminus),
- Atlanta Metro Studios (Route 181, Route 89 terminus),
- Washington Rd at Kentucky Ct/Dobbs Way (Routes 84, 181),
- Thomasville (near terminus of Routes 4, 49),
- Downtown Hapeville (Routes 172, 193).

**Table 25** | High-ridership stops with missing amenities

<b>Key</b>	<input checked="" type="radio"/> Yes	<input type="radio"/> No	<input checked="" type="radio"/> Yes/No	* Not Accessible
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Area and Bus Routes Affected	Stop ID	Seat	Shelter	Trash Can	Wayfinding	Side-walk	Cross-walk	Tactile Guide	Signal	Curb Cut
<b>North Lake Mall - Ranchwood and Weems Dr (terminus of Routes 30, 126, 133)</b>	213576	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>
<b>E Ponce de Leon Ave@4600 inbound (Clarkston) (Route 120)</b>	901894	<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/> *	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**Table 25 (Continued)** | High-ridership stops with missing amenities

Area and Bus Routes Affected	Stop ID	Seat	Shelter	Trash Can	Wayfinding	Side-walk	Cross-walk	Tactile Guide	Signal	Curb Cut
<b>ATL Airport, International Arrivals (Route 191)</b>	212439	○	●	○	○	●	●	○	○	○
<b>Forest Cove Apartments (McDonough Boulevard in Thomasville) (Route 49)</b>	140006 140008	○	○	○	○	●	○	●	○	●
<b>Old Dixie Road at Pineridge Road (Route 192)</b>	212671	○	○	●	○	●	○	●	●	●
<b>Panthersville Road at Bouldercrest Road (end of Route 15)</b>	212192	○	○	●	○	●	●	○	○	●
<b>Linecrest Rd @ 3800 (end of Route 15)</b>	211891	●	●	●	○	○	●	○	○	○
<b>MLK @ Fairburn Rd Outbound (Route 73)</b>	905855	○	○	●	○	●	○	●	●	●
<b>Southlake Mall (Routes 193, 194, 196 currently Routes 197, 198)</b>	212168	●	●	●	●	○	●	○	○	○
<b>Atlanta Metro Studios (End of route 89, Route 181)</b>	191003 191084	○	○	●	○	●	○	●	○	○

**Table 25 (Continued)** | High-ridership stops with missing amenities

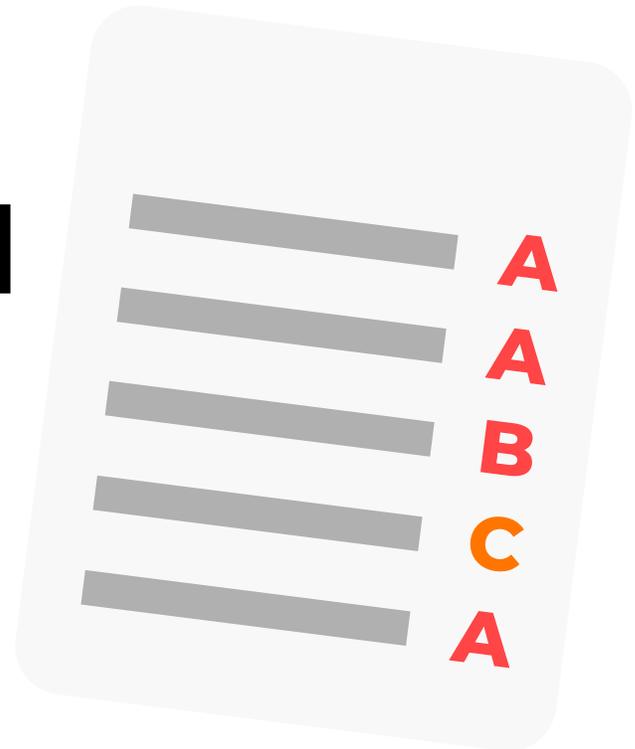
Area and Bus Routes Affected	Stop ID	Seat	Shelter	Trash Can	Wayfinding	Side-walk	Cross-walk	Tactile Guide	Signal	Curb Cut
<b>Near Washington Plaza (Routes 84, 181)</b>	146098 166144	○	○	○	○	●	◐	○	○	○
<b>Downtown Tucker (Routes 75, 121, 124)</b>	211569 211570	●	○	●	○	●	●	●	●	●
<b>Thomasville (Routes 4)</b>	151152 151020	○	○	○	○	○	●	●	○	●
<b>International Plaza outbound (Route 89, 189, 195)</b>	176088	●	○	●	○	●	●	○	○	●
<b>Downtown Hapeville</b>	158116 158118 158260	●	○	●	○	●	◐	○	○	○
<b>DeKalb Farmers Market (Inbound)</b>	904067	●	●	○	○	●	○	●	●	●
<b>Riverdale near Jiffy Lube (Route 196)</b>	212124	●	●	●	● *	○	○	●	●	●
<b>4375 Cascade Road</b>	900861	●	●	●	○	●	●	○	○	○

SECTION 5

# MARTA Army's Bus Stop Report Card



# Bus Stop Report Card



**MARTA Army has developed the MARTA Bus Stop Report Card using data collected from the Bus Stop Census Survey. It is modeled after the ASCE's Infrastructure Report Card. A score and an overall letter grade is assigned to each surveyed bus stop based on its available amenities.**

In school, teachers give out report cards for students to track their performance in class through letter grades. The report card gives students a chance to understand how they have performed on assignments and tests, where they need to study more, and what their final grade may be at the end of the year.

It's no surprise the simplicity of the report card's design has been used outside the classroom to track

progress for much larger "assignments." The American Society of Civil Engineers (ASCE) uses this format to assign a letter grade to different components of American infrastructure, such as transit, bridges, and waterways. These grades are published in their popular Infrastructure Report Card every four years. According to the ASCE, these report cards "examine current infrastructure conditions and needs, assign grades and make recommendations to raise them."

**This section describes MARTA Army's report card grading criteria, grade descriptions, and report card results.**

## Grading Criteria

The Primary Bus Stop Characteristics from the survey responses are used as the grading criteria for the MARTA Bus Stop Report Card. Based on the response provided in a survey, each characteristic is assigned points according to the grading scheme in Table 26 below. A bus stop can earn up to 100 points. Because Operation Bus Stop Census focuses on accessibility and safety for the transit-dependent population, the

proposed grading chart places a significant weight on crosswalk and sidewalk availability, and quality of boarding area.

Secondary Bus Stop Characteristics that depend on subjective perception, such as reporting of dangerous behaviors, are excluded from the grading criteria. Atlanta Streetcar stops are not graded because they are all built according to a standard set of amenities.

**Table 26** | Bus stop scoring chart

Point Category	Description	Points
<b>Sidewalks</b>	Bus stop has a paved sidewalk leading to the boarding area from at least one direction.	<b>25</b>
<b>Crosswalks</b>	<p>Bus stop is within 100 feet of a main street crosswalk with crossing infrastructure like traffic lights, curb cuts, audio/visual crossing signals, or tactile guide strips.</p> <p>For each piece of missing crossing infrastructure, a specified amount of points is deducted based on the road classification from <a href="#">OpenStreetMap</a>.<sup>32</sup> Primary and trunk roads lose 6 points for missing main street marked crosswalks, traffic lights, crossing signals, curb cuts, and tactile guide strips. 5 points are deducted for secondary roads and 4 points deducted for tertiary roads. Residential roads have 3 points deducted for missing crosswalks, curb cuts, and tactile guide strips on the main street. Unclassified roads have two points deducted and service roads have 1 point deducted for the same missing crossing infrastructure.</p>	<b>30</b>
<b>Boarding Area</b>	Bus stop has a paved boarding area (partial credit of 5 points for asphalt boarding area).	<b>20</b>
<b>Seating</b>	Bus stop has a bench or other seating.	<b>10</b>
<b>Shelter</b>	Bus stop has a shelter.	<b>10</b>
<b>Wayfinding</b>	Bus stop has wheelchair accessible wayfinding information (partial credit of 2 points if wayfinding is available but is not wheelchair accessible and 1 point if only customer service information is present).	<b>3</b>
<b>Trash Can</b>	Bus stop has a trash can.	<b>2</b>
<b>Total Points</b>		<b>100</b>

# Grading Scale

To help rank the overall bus stop quality, we created a grading scale in which bus stops receive a letter grade from A to F. In Table 27, we describe the expectations for each letter grade.

**Table 27** | Bus stop grading scale.

Grade	Point Range	Description	Example Photo
<b>A</b>	<b>90+</b>	Bus stops are excellently equipped, being both safe and accessible to riders. They also offer various amenities that improve the ridership experience such as wayfinding information, trash cans, seating, and shelter.	
<b>B</b>	<b>80-89</b>	Bus stops are well equipped. Riders at Grade B stops are likely to enjoy sidewalks, marked main street crosswalks, and paved boarding areas. Other amenities such as shelters and wayfinding information may be lacking at these bus stops.	
<b>C</b>	<b>70-79</b>	Bus stops are fairly equipped. Most bus stops in this grade category have sidewalks, marked main street crosswalks, and paved boarding areas. Other amenities such as wayfinding information, trash cans, seating, and shelter are lacking from most bus stops in this category.	
<b>D</b>	<b>60-69</b>	Bus stops are poorly equipped. Many bus stops in this grade category may have marked main street crosswalks but are lacking adequate crossing infrastructure, though most have a sidewalk and paved boarding area. Other amenities such as wayfinding information, trash cans, seating, and shelter are lacking from most bus stops in this category.	
<b>F</b>	<b>59 or less</b>	Bus stops are unacceptable, unsafe, and inaccessible. Bus stops in this grade category are missing one or more of the three pillars of bus stop accessibility: sidewalks, marked crosswalks, and paved boarding areas. Bus stops in this category also lack basic amenities such as wayfinding information, trash cans, seating, and shelters.	

## Final Grade

The census is over and the grades are in! Unfortunately, it is not a good report card for MARTA bus stops. The average grade for all bus stops surveyed, weighted by the total average weekly passengers getting on and off the bus, was 71% or a C-minus. The breakdown of the grades is included in Table 28 below and in Figures 38 and 39. Grade A and B bus stops only made up 12% of

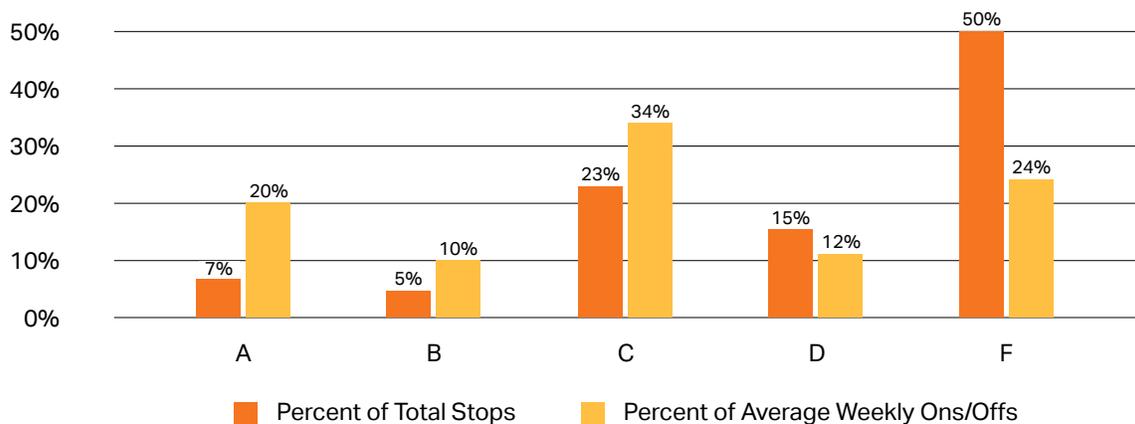
all stops surveyed and 30% of the total average weekly ridership. All other stops were grades C or below, with grade F stops accounting for 50% of the stops surveyed. 58% of the total average weekly ridership took place at Grade C and Grade F stops with the Grade C stops accounting for 10% more passengers than Grade F stops. Grade D had the second lowest ridership share at 12%.

**Table 28** | Count of stops and proportion of ridership by letter grade.

Letter Grade	Count of Stops	Percent of Total Stops	Total Avg. Weekly Ridership	Percent of Total Avg. Weekly Ridership
<b>A</b>	213	7%	132,932	20%
<b>B</b>	161	5%	71,282	10%
<b>C</b>	747	23%	232,873	34%
<b>D</b>	511	15%	78,738	12%
<b>F</b>	1,616	50%	166,660	24%

Grades A through C bus stops only represent one third of the surveyed stops but account for nearly two-thirds of the ridership. Conversely, Grade D and F stops are two-thirds of the surveyed stops but only serve one third of the ridership. Although the majority of bus stops surveyed were Grades D and F, the majority of passengers boarded and exited the bus at stops with Grades A through C.

**Figure 38** | Breakdown of stop grades compared to ridership.



The map in Figure 39 shows the location of grades among the surveyed bus stops in the MARTA service area (maps of each individual grade are included in Appendix F). Grade A bus stops, infrequent in the service area, typically have a shelter and support more than 250 riders weekly, pre-COVID. Route segments with Grade A bus stops include:

- Buford Highway south of Northeast Plaza (*Route 39*)
- Memorial Drive (*Route 121*)
- Candler Road at South Dekalb Mall (*Route 15*)
- Cleveland Avenue (*Route 78*)
- Campbellton Road (*Route 83*)
- Roswell Road and Hammond Drive (*Routes 5 and 87*)

Grade B bus stops are more sparse than Grade A bus stops. This is due to the structure of the grading criteria and the amenities at a typical MARTA bus stop. Bus stops with a grade of B typically fall into a rare category where they either have all amenities except wayfinding information and crossing infrastructure

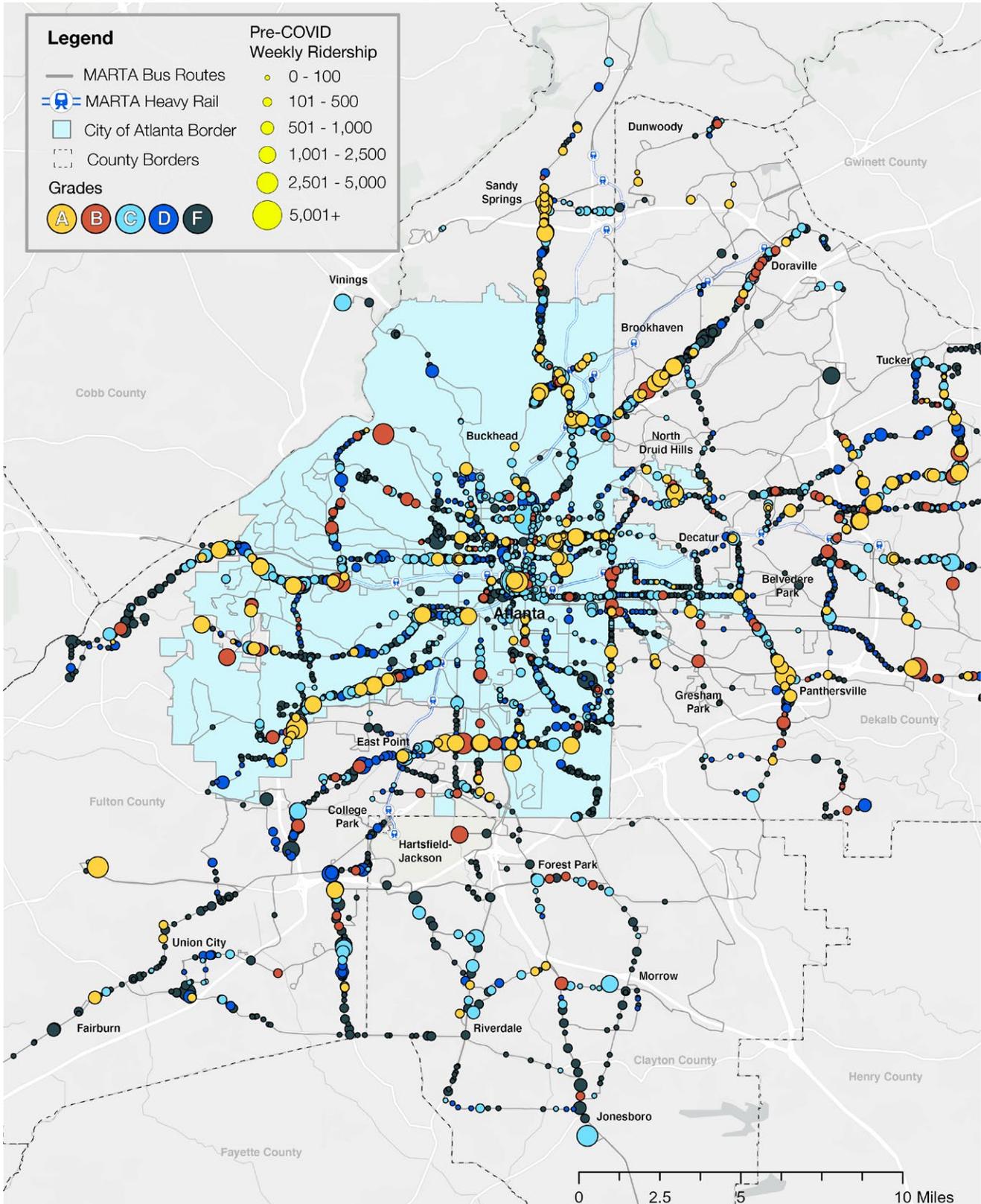
or have all amenities except a shelter and wayfinding information. This combination of amenity levels and features is not common among MARTA bus stops, which is why it is the lowest represented of all grades.

Grade C bus stops are the second most common bus stop and account for the most pre-COVID weekly ridership of all grade categories. Figure 39 shows Grade C bus stops in Downtown/Midtown Atlanta, at some MARTA rail stations, at end-of-line stops, and sheltered stops without main street crosswalks.

Grades D and F bus stops are the remaining majority of surveyed bus stops and can be found along every single route surveyed. Concentrated areas of Grade D and F bus stops include:

- Buford Highway between Northeast Plaza and Chamblee-Tucker Road (*Route 39*)
- Leila Valley Neighborhood (*Route 4*)
- Roosevelt Highway (*Route 180*)
- Clayton County (*Routes 191, 192, 193, 197, and 198*)
- Fulton Industrial Boulevard (*Route 73*)

Figure 39 | Map of bus stop grades compared to ridership.



SECTION 6

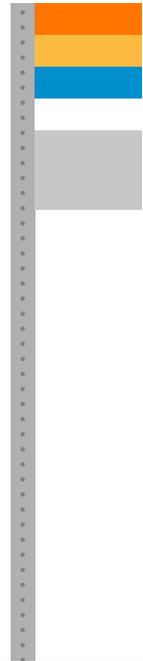
# MARTA Army's Recommendations



# Recommendations

In this chapter, we formulate recommendations for the stakeholders, such as MARTA, the ATL, cities and jurisdictions, and community organizations, into three main threads:

1. Planning and Design
2. Data Collection and Sharing
3. Community Engagement





## Planning and Design

Good bus stops begin with good planning and design. Accounting for bus stops early on in the planning and design process ensures that elements needed for safe, accessible, and dignified bus stops, such as safe crosswalks and clear sidewalks, are not left out of the final product. Unfortunately, the Bus Stop Census found that proper planning and design for bus stops is lacking across many of the stops surveyed.

The survey data confirms that 25% of surveyed bus stops lack any paved sidewalks, and 41% of surveyed bus stop sidewalks are obstructed, so that even when a sidewalk exists, it is still inaccessible to persons using mobility devices. Also, 47% of the stops surveyed lack accessible nearby crosswalks, and of the stops with nearby crosswalks, 45% lack curb cuts, and 60% lack tactile strips. In addition, information at typical MARTA bus shelters is not posted at eye level, and the font used is too small to be comfortably read from seated wheelchair height. A lack of comprehensive planning and thoughtful design for bus stops has contributed to this situation. The recommendations described in this section outline ways to bring bus stops front and center in the planning and design process.

Recommendations for improving design guidelines and signage are all within MARTA's control and could result in near-term signage improvements. Recommendations for sidewalks and crosswalks near bus stops are within jurisdictions' control, and jurisdictions can use awareness of bus stop locations to prioritize sidewalk and crosswalk construction. Such construction, in the near and medium term, would benefit the safety and comfort of bus riders and also those local neighborhoods at large. Coordination with developers seems more difficult to achieve because bus stops appear to be a finishing touch to a long-term project. The success of coordination efforts is contingent upon including bus stops early in the process and meeting the corresponding requirements before the project advances to the next stage.

### Improve Bus Stop Design and Placement

#### Adopt Universal Design Guidelines

MARTA bus stops must meet the accessibility standards as required by the [Americans with Disabilities Act \(ADA\)](#).<sup>33</sup> These standards provide minimum design requirements for amenities such as boarding areas, sidewalks, and signage, but it should be noted that they are the *minimum*. MARTA should go above and beyond to promote more equitable and accessible bus stops within their existing Service Design Guidelines by adopting the principles of universal design.

Beyond ADA requirements, Universal Design is defined by the Center for Excellence in Universal Design out of the National Disability Authority as "the design and composition of an environment so that it can be accessed, understood and used to the greatest extent possible by all people regardless of their age, size, ability or disability."<sup>34</sup> Practitioners of universal design agree that when objects and the environment are designed to meet the needs of the greatest extent

of users, everyone benefits. When it comes to bus stops, this is a simple concept to grasp. For example, a sidewalk built to allow wheelchair users to access a bus stop also benefits parents with strollers or a veteran with limited mobility, and it can even attract new riders. Research has shown that improved bus stops are associated with a significant increase in overall ridership and a decrease in paratransit demand.<sup>35</sup>

Fortunately, MARTA and the ATL can apply recognized universal design principles and practices to their service design standards. In "Transit Universal Design Standards," 2020, the [American Public Transportation Association \(APTA\)](#) describes the seven principles for universal design, the varying levels of ability and specific needs of transit riders, the accommodations required to meet those needs, and best practices for implementation.<sup>36</sup> Another great source for universal design guidelines is the National Aging and Disability Transportation Center's "Toolkit for the Assessment of Bus Stop Accessibility and Safety." This toolkit lists the minimum ADA requirements along with universal design recommendations.

## Planning & Design

### Add wayfinding signage to bus stop markers

The most significant gap MARTA can address in the design of bus stops is the bus stop wayfinding signage. The Bus Stop Census survey found that only 9% of bus stops surveyed had all route information and customer service information present. This 9% of bus stops only accounted for 27% of the ridership. This means 73% of MARTA bus riders get on and off at stops without robust wayfinding information to guide them during transfers and to increase the legibility of the bus network.

Wayfinding information is a component of bus stops that is under the primary control of MARTA. As a result, this is the easiest improvement MARTA can make, at a relatively low cost, without coordinating with multiple jurisdictions.

There is reason to be hopeful the gaps in wayfinding information will soon be closing. Just before the COVID-19 pandemic started, MARTA and other transit agencies in metropolitan Atlanta announced<sup>37</sup> the roll out of the new regional bus stop signage, as seen in Figure 40, that includes route numbers, destinations, and an accessible customer information panel at every stop.<sup>38</sup> The information panel contains the stop ID and customer service phone numbers. The panel should ideally also include a QR code, website, or, at a minimum, a phone number that riders can use to obtain real-time bus arrival information.

**Figure 40** | Top: New regional bus stop signage for Xpress bus routes in Midtown Atlanta (Xpress chose to omit route destinations). Bottom: Detail of the ADA-accessible information panel for that stop.



## Planning & Design

### Update route information at shelters

Although MARTA bus shelters have information panels, route maps and schedules are missing at many of the surveyed shelters, and some of the information is outdated. To maintain the readability of the bus system, MARTA should commit to improve and keep bus information up to date at bus shelters, as well as to replace missing maps and schedules in a timely manner.

### Improve wayfinding accessibility at shelters

A surprising finding from the Bus Stop Census survey is that, of the bus stops surveyed that had some wayfinding information, nearly 92% did not have it at the eye level of a person using a wheelchair. The majority of the bus stops with wayfinding that was not at the eye level of a person using a wheelchair were at shelters. The average wheelchair eye level is between 43 and 51 inches.<sup>39</sup> In contrast, the bottom of the route schedule panel at most MARTA shelters is 55 inches above the ground (Figure 41, top).

In addition, the small font used in the route maps and schedules is hard to read, even for those with good eyesight and from a close distance. The height of the smallest characters in the route schedule insert is around 1/16th of an inch (Figure 41, bottom), which is 10% of the 5/8th of an inch minimum character height required in the 2010 ADA Standards for visual character signage.<sup>40</sup>

The MARTA system map found behind the bench in most bus shelters needs an improved, accessible design. The text on the current map is too small to be legible, lacks proper color contrast for people with visual impairments, and the details of the map cannot be seen from up close when a bench in front of the map obstructs wheelchair access, or when people sit on that bench.

For these reasons, we recommend redesigning wayfinding signage in existing shelters to meet ADA requirements, increasing legibility and accessibility.

**Figure 41** | Measurements showing poor accessibility of route schedules and maps at MARTA shelters.



## Planning & Design

### Balance stops that have low ridership and a low score, invest resources in improving high ridership stops to make them safe and accessible

Having too many bus stops that are too close to another is a hindrance to better bus stops and service. Bus stop balancing, which consists of increasing the spacing between bus stops by moving or removing some of them, can address this problem in a few ways:

- Given MARTA's budget constraints, balanced stops mean more funds overall per stop to improve safety, accessibility, and dignity.
- Balanced stops accumulate roughly the ridership of the stops they combine. The combined ridership could meet criteria for seating or other amenities.
- Balanced stops could make bus service faster and more reliable. Jarrett Walker, in his book "Human Transit," describes how increasing the spacing between bus stops has the advantage of lowering travel time because the bus has fewer places where it needs to slow down, pull to the side, pick up passengers, and merge back into traffic.<sup>41</sup>

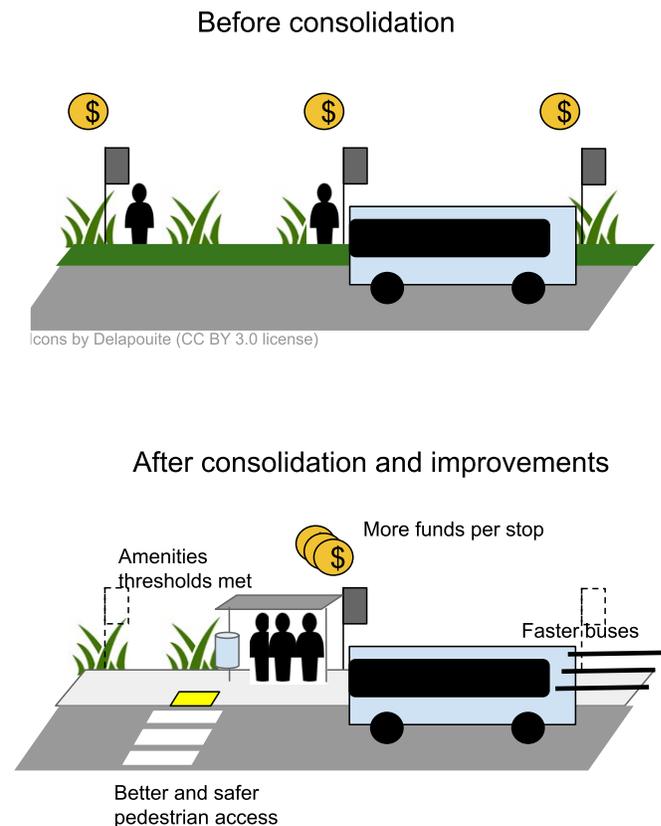
However, the process of balancing stops must be thoughtful and take into consideration the potential harmful effects of consolidating stops:

- Balanced stops involve slightly longer walking distances. Given the MARTA service area is subject to heat, hills, and humidity, this tradeoff should not be ignored.
- Removing stops that lack sidewalks can force riders to travel further in inaccessible conditions.

The decision to rebalance stops should be guided by the following factors described below:

- Existing ridership and amenities,
- Community input.

**Figure 42** | Illustration of bus stop consolidation and potential resulting improvements.



In selecting the bus stops to be rebalanced, it is important to note that ridership and amenities can vary significantly from one stop to the next. All bus stops should be located where accessible sidewalks and safe crossings exist or can be created. Bus stops that have low ridership and lack basic amenities, sidewalks, paved boarding areas, and safe crossing infrastructure should be considered for consolidation. Bus stops where safe crossings cannot be built should be removed or relocated. This could affect over a third of the surveyed stops that have a grade of F and less than 7 passengers per week.

## Planning & Design

An illustration of the potential outcomes of bus stop consolidation is shown in Figure 42. Funding and permitting to expedite improvements, especially safe crossings and sidewalks, for the bus stops that remain, should be coordinated between MARTA and transportation divisions in city and county governments. To increase bus stop accessibility, we recommend that sidewalk funding be directed in first priority to roads served by MARTA bus routes.

The balancing of bus stops should not be done in a vacuum. Community input should be collected, especially from riders who use the stops under consideration for consolidation. Collecting input from older riders, people with disabilities, and women should be a top priority as their experience will reveal specific areas of need to be addressed.

Done successfully, with careful attention to rider's needs, the thoughtful consolidation of bus stops not only offers opportunity for more attention and investment in the remaining stops, but also the chance for improved bus service.

### Build and Maintain Accessible Sidewalks and Safe Road Crossings Near Bus Stops

Sidewalks and safe crossings are essential to providing safe, accessible, and dignified bus stops. They make bus stop access possible for people with limited ability, especially people using assistive mobility devices or parents with strollers. They also enable a safe pedestrian environment around the bus stop, eliminating the need for riders to walk in the roadway or to cross the street where traffic is not signaled to stop. Finally, sidewalks and safe crossings show respect to riders in a way a dirt path or hazardous road crossing never would.

However, in a state traditionally focused on building roads, most road designs only allocate a negligible portion of space and funding to pedestrians. As

a result, we have noted that sidewalks and safe crossings are amenities lacking for over 25% and 47% of surveyed bus stops, respectively.

The availability and quality of sidewalks, marked crosswalks with curb cuts, tactile strips, and traffic signals near MARTA bus stops is heavily dependent on the infrastructure around the stop. Developed urban centers such as Downtown and Midtown Atlanta, or school campuses, are more likely to feature quality sidewalks, crosswalks, lighting, and safer road conditions for pedestrians, whereas roads in suburban environments often lack sidewalks and safe crossings and tend to have more pedestrian fatalities. MARTA has little to no control over sidewalk or crosswalk conditions. Gaps in the pedestrian infrastructure on a public road must therefore be addressed by the city, county, or state, whichever owns it.

#### Assessing the sidewalk and safe crossing gaps

Before jurisdictions and communities can address gaps in pedestrian facilities, they must take an inventory of existing conditions. Walking audits are a common approach to creating this inventory. One popular walking audit tool is the Pedestrian Environment Review System (PERS). PERS is a software that objectively assesses the quality of the pedestrian environment, including qualitative and quantitative data on sidewalks, crossings, and waiting areas around bus stops, among other pedestrian facilities.<sup>42</sup>

The [Atlanta Department of Transportation \(ATLDOT\)](#) conducted a sidewalk audit using a methodology similar to PERS and determined that only 45% of the 2,000 miles of city streets have sidewalks, resulting in a sidewalk funding gap of \$1 billion.<sup>43</sup> Field operators and support staff created a sidewalk inventory by riding on every mile of sidewalk in Atlanta using all-terrain vehicles. They gathered data such as HD video, imagery, GPS, LiDAR scans and other attributes to create a Sidewalk Condition Index that ranks all sidewalks and curb ramps from very poor to excellent.

Sidewalk inventories do not have to be as thorough or technology-heavy as the one by the ATLDOT. In fact,



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community organizations and neighborhood residents can conduct their own walking audits using practical guides intended for the general public, such as “Let’s Go For A Walk - A Toolkit for Planning and Conducting a Walk Audit” published by the Safe Routes to School National Partnership.<sup>44</sup>

Collecting data on sidewalk and safe crossing coverage is essential for jurisdictions and communities to determine the extent of the need for maintenance and construction and prioritizing improvements.

### Prioritizing the locations for improvements

Public works departments at all levels of government face the challenge of filling the sidewalk and crosswalk coverage gap with limited resources and competing needs. As a result, they have to optimize the locations and substance of improvements to pedestrian facilities.

The ATLDOT utilizes a home-grown Safety, Equity, and Mobility (SEM) methodology, in conjunction with the Sidewalk Condition Index, to prioritize sidewalk improvement projects. The SEM methodology, similar to that of PERS, assesses, among other factors, whether the location of a needed sidewalk is along a High-Injury Network road, whether it is in communities with low vehicle access or a concentration of minority populations, and, whether the sidewalk is in proximity to MARTA bus stops.

To improve the safety and access of all bus riders, MARTA Army recommends that local and state governments follow the methodology used by PERS and the ATLDOT by prioritizing sidewalk and crosswalk improvements near bus stops regularly used by more than 15 people on a typical day. This criterion is in addition to other criteria assessed including pedestrian traffic levels, school access, community input, and adherence to ADA requirements.

### Scoping sidewalk and crosswalk improvements at prioritized locations

After prioritization, local and state governments should determine the best way to fill the gap in sidewalks and safe crossings. Multiple options are possible for each location, depending on the road type and ridership on the buses that serve the location.

**Figure 43** | Example of pedestrian infrastructure improvements on Buford Highway near Northeast Plaza. Top: photo taken in 2009 (source: Binh Dam). Bottom: photo from the 2020s (source: Google Street View). Notable differences between the two include sidewalk improvements and the addition of a median, a crosswalk and pedestrian hybrid beacon.



Options for sidewalks, though they may differ in material, width, installation techniques, and cost, are really different shades of the same color: a flat, paved path without obstructions in the path of a person walking or rolling.

Options for safe crossings are more diverse, however. The ideal crosswalks for the purposes of the Bus Stop Census have markings, traffic lights, curb cuts, crossing signals, and tactile guide strips. Building



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these fully “featured” crossings, though common, may not always be possible or cost-effective.

For one, fully featured crosswalks with red light signals are subject to pedestrian activity thresholds. The MUTCD requires the following before a traffic signal can be installed:<sup>45</sup>

- 93 crossings during one hour of the day for a tri-color traffic signal,
- 20 crossings during one hour of the day for a pedestrian hybrid beacon (a traffic signal that shows red lights upon pedestrian request but is normally off).

Many MARTA bus stops, however, are used by fewer than 20 riders a day or are located where a signalized crossing is unlikely to be placed. For such stops, a spectrum of improvements can make crossings safer (see Appendix G for details):

- Median refuge islands that let pedestrians cross in two shorter stages while dealing with traffic from one direction at a time,
- Overhead lighting and signage that passively indicate road crossing zones,
- Rectangular rapid flashing beacons to encourage drivers to yield to pedestrians.

Crossing improvements come with different costs and benefits. A median refuge island costs in the \$10,000s, and research shows that median islands reduce the likelihood of pedestrian collisions by 39 percent at locations without crosswalks and by 46 percent at locations with crosswalks.<sup>46</sup> A hybrid beacon or full traffic signal can cost \$200,000 or more but will force cars to a stop. Agencies must balance the extent of crossing improvements with the number of locations that would benefit from safer crossings

With regards to making crossings safer, one size doesn't fit all. The appropriate crossing improvements depend on road width, vehicle speeds, volume of vehicles and pedestrians, and expected benefits and tradeoffs when built. Engineering standards, professional judgment, and input from the community are all essential. The MARTA Army encourages readers to refer to [FHWA's "Pedestrian Safety Guide and Countermeasure Selection System"](#) and the 2014

PEDS report, [“Safe Routes To Transit - Toolkits for Safe Crossing in Metro Atlanta”](#) for a comprehensive analysis of safe crossing options.

### Funding and control of sidewalk improvements

Once pedestrian facility improvements are identified and prioritized, funding for the improvements must be secured. Multiple sources of funding should be explored to fill in as much of the gap as possible. Local and state jurisdictions have multiple options when it comes to funding the repair, installation, replacement, and maintenance of pedestrian facilities. Levying a sales tax is one option, although a regressive one. In the Atlanta region, funding for sidewalk repair and replacement may come from a jurisdiction's budget or from a [T-SPLOST \(Transportation-Special Purpose Local Option Sales Tax\)](#) approved by referendum. Sales tax funding is often tied to project lists defined prior to a referendum being called. Efforts to prioritize sidewalk and crosswalk construction near bus stops would benefit bus riders and non-riders, but must occur while the project list is being defined.

Other options include using existing property taxes and administrative fees, impact fees charged to developers, issuing bonds, pursuing grants such as the Highway Safety Improvement Program, conducting special community wide assessments (such as [Community Improvement Districts \(CID\)](#) that are self-taxing to fund improvements to public infrastructure within the community boundaries), assessing property owners, and implementing utility fees. Local and state jurisdictions should also aim to use funding efficiently by piggy-backing on other projects planned or underway in the public right of way with nearby sidewalk repair/replacement work.<sup>47</sup>

Sidewalk funds are sometimes established when lawsuits from citizens with mobility impairments require jurisdictions to set a timeline to invest in sidewalk maintenance. Funds are also established as a cost savings measure when lawsuits become more expensive than the cost of building and maintaining the sidewalks themselves. Sidewalk funding should instead be regarded as an investment to all pedestrians, regardless of physical ability.



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In addition to funding, and for the purpose of addressing pedestrian facility needs in an “expedient and equitable fashion,” sidewalk maintenance and replacement should be the sole and central responsibility of the local or state jurisdiction, rather than that of individual property owners.<sup>48</sup> Control over the road infrastructure comes with responsibility towards all road users, including pedestrians and non-motorized users of all abilities. A jurisdiction that builds and maintains sidewalks and safe road crossings, and more generally, slow/complete streets, communicates that it values the safety of all its constituents.

### **Require developers to coordinate bus stop planning with MARTA on new or redeveloped property**

Bus stops on private property or within a public right of way often suffer from a lack of planning and design from the jurisdiction they are in. This is evidenced by the nearly two-thirds of bus stops surveyed with a grade of F. Cities and counties are constrained by budgets and manpower and lack the funding needed to bring each individual bus stop up to the minimum ADA requirements. Improving the accessibility of stops is expensive, often requiring the purchase of right of way from property owners before the construction of the sidewalk or boarding area can begin. But one tool cities and counties have under their belt is their zoning and development code of ordinances.

In the zoning and development code of ordinances, city, county, and regional governments can require specific permits and activities for development or redevelopment that impact the streetscape infrastructure. The City of Sandy Springs, GA offers a good example of this as development permits, land disturbance permits, building permits, and all commercial, office or multi-family construction located on any street require the installation of a sidewalk if a code-compliant one does not already exist.<sup>49</sup> A technical manual accompanying the city's Code of Ordinances specifies requirements for the design of the sidewalk and even the adjoining curb cuts at intersections.

If municipal or county codes can be used to require the construction of accessible sidewalks and curb cuts for projects within a jurisdiction, they can also be used to require the construction of accessible paths and boarding areas for bus stops located within a project's boundaries. Athens-Clarke County, GA offers a comprehensive permitting process

where transit amenities that meet the county design standards can be required for commercial and large-scale developments.<sup>50</sup> By codifying requirements for bus stops in zoning and development standards, city and county governments can take a proactive step to ensure accessible bus stops are the standard for all new developments or can be enforced for existing developments.

To take a step following the model of Athens-Clarke County, the zoning and development code of ordinances for jurisdictions in the MARTA counties should establish a formal process for builders, developers, and homeowners to coordinate with MARTA when their project impacts an existing MARTA bus stop, or is on a street where MARTA could start new service soon. The purpose of such coordination is to 1) ensure access is maintained at the bus stop while development is ongoing and 2) ensure the bus stop is built to MARTA's standards and requirements.

In addition to establishing a formal process, the zoning and development code of ordinances should also provide contacts to MARTA's Planning and Operations departments, detailed design drawings of bus boarding pads and shelters, references to the minimum ADA requirements, universal design principles, research on the benefits of well-designed bus stops, and any other resource to facilitate the final design or ensure that the outcome aligns with MARTA standards, operational needs, and long-term plans as well as the needs of the riders.

Codifying the design and planning of bus stops into a city or county permitting process legitimizes the process and reduces the chance of bus stop design and planning being an afterthought on developments small and large.





## Data Collection and Sharing

TransitCenter's first advice for making great bus stops is to "be an expert on your bus stops." This advice is primarily an expectation for MARTA because it is responsible for the placement and maintenance of bus stops and for listening to and resolving customer complaints. But the advice also applies to local jurisdictions. City and county governments have much to gain in knowing more about their bus stops because 1) the condition of bus stops have a direct impact on the constituents of local elected officials and 2) improving bus stops has the potential to advance many of the goals local jurisdictions pursue such as economic growth, safe streets, and sustainable transportation. Even community organizations, such as MARTA Army, need to be experts on bus stops because that knowledge informs the advocacy goals of these organizations.

We all share the responsibility of becoming experts on our bus stops. By sharing this responsibility, a comprehensive, up-to-date, and rider-centric window into the conditions of stops across the network can be achieved. A robust system for collecting and sharing standardized bus stop data would greatly facilitate the collaboration between the public and the transit agency or the department of public works. We also recommend publishing the shared data in some standard format so that it can be used by other organizations and by various software such as accessibility maps or trip planning applications.

### Create a better funnel for bus stop maintenance needs

#### MARTA311

A popular service provided by the City of Atlanta is ATL311, the city's primary contact for non-emergency services and information. Residents can contact ATL311 using phone, email, a smartphone app, or even social media to report issues such as potholes or missed trash pickups. The publicized benefits of the service are the variety of methods to submit issues or search for information, the service's ease of use, the responsiveness of the city, and the transparency on the progress of work performed. Simply put, ATL311 gives residents the ability to take an active role in their community by facilitating the sharing of information between the residents and city departments.

An opportunity exists to upgrade MARTA's current rider input intake process to incorporate the best practices from ATL311 and similar services. MARTA customers are currently able to submit issues and comments related to MARTA bus stop maintenance through MARTA's customer service phone number, email, or the customer comments & suggestions portal.<sup>51</sup> Compared to the ATL311 services, MARTA's methods for collecting issues or disseminating information on bus stops lack the ease of use, transparency, and

prominence. The service offered by ATL311, when adapted for bus stops, would benefit MARTA and its riders for a few reasons described below.

The first is the ability to route bus stop maintenance or information requests by type of request. ATL311 does this by listing all the requests that can be made within a larger category of services. For example, on the ATL311 website, under the Streets and Sidewalks category, there are links for requesting an ADA ramp, requesting an inspection of sidewalks, reporting potholes, requesting a new sidewalk, and much more. Just as streets and sidewalks have a multitude of needs, so do bus stops. To name a few, riders may want to request trash pick up at their shelter, request to install an ADA boarding area, report overgrowth blocking the bus stop marker, request the installation of a new shelter, and more. As highlighted in Table 1 in the Overview of the MARTA Bus System section, the responsibilities for bus stops are spread among various agencies and jurisdictions. Some requests require the rider to contact MARTA while others would be the responsibility of the local jurisdiction's public works department. Amidst the plethora of problems and players in the MARTA bus stop ecosystem, a system like ATL311 for bus stops (henceforth referred to as MARTA311) could route requests made by riders to the proper authority, ensuring requests are quickly acknowledged and resolved.

## Data Collection & Sharing

MARTA311 would be a robust source of information for riders who are interested in making a request but do not know where to start or how the process works. Within MARTA311, MARTA and jurisdictions should publish the criteria and processes used to evaluate requests for shelters, benches, sidewalks, crosswalks, and other bus stop-related amenities, as well as update users on the progress for each granted request. Feedback mechanisms should also be in place to allow users of the MARTA311 system to report their satisfaction with the service.

The MARTA311 system should also clarify the responsibilities of each party involved in the planning, design, construction, operation, and maintenance of bus stops so users can hold the correct party accountable for the resolution of submitted requests. Making the avenues for submitting and tracking requests easily available could increase confidence in the submission process while making MARTA and the jurisdictions both transparent and accountable.

Data from MARTA311 could be used to update local bus stop databases, analyze maintenance trends, and justify more funding for bus stop maintenance needs. Over time, bus stops would incrementally be upgraded and improved, enhancing the bus stop experience for the rider and improving the reputation of MARTA and local jurisdictions.

The creation of this type of service need not be too costly either. MARTA currently uses the See and Say App to process and route public safety issues to the MARTA Police Department. A pilot could be implemented in this environment to gauge success before implementing a more permanent solution.

With nearly 300 people assisting in the surveying effort, there is an active amount of metropolitan Atlanta residents that would appreciate and use a MARTA311 service to report transit-related issues. An easy and accessible path for riders to report issues is essential to providing consistent, high-quality transit.

### Bus Stop Listening Sessions

Even without a MARTA311 service, there are other low-effort methods of gathering information on the needs of bus riders as it relates to bus stops. One such method involves holding bus stop listening sessions.

A bus stop listening session is an informal, facilitated discussion held with bus riders to understand their experience at bus stops. Participants in these sessions would be asked to share what they like and don't like about bus stops, including how they think they could be improved.

Listening sessions should be held at MARTA stations or transit centers where nearly all bus routes begin or end. The location can be changed each session so that each station or transit center within the network has a chance to host the session. Representatives from MARTA should be ready to listen to a diverse population of riders, including non-English speakers and signers. In return for rider's time and feedback, it is advised compensation, such as free trip pass, be distributed.

Listening sessions serve as a low-tech, low-effort approach to gathering input on bus stops from the riders who wait at them everyday. It also serves as an outlet for bus riders who do not feel like their voice is heard. Recent public participation meetings for the bus network redesign were filled with public comment not on the redesign concepts, but rather on problems experienced at bus stops. Giving riders a space to voice their concerns may have the added benefit of improving the productiveness of other public participation events.

### Promote standardized, open data formats for accessibility and bus stop amenities

Open data standards in transportation, including GTFS (General Transit Feed Specification) and OpenStreetMap, promote and support a myriad of trip planning apps like Google Maps, OpenTripPlanner, Transit App, and more. Open data standards allow communities to enter and curate such data and the



## Data Collection & Sharing

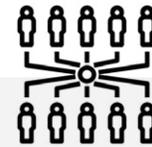
related processing and analysis software. If published in standard, open data formats, sidewalk data and bus stop amenities data could also be leveraged in these apps. Consultants and advocacy groups like MARTA Army should promote and use such standards when they publish the relevant data in their possession.

For cataloging bus stop amenities and sidewalk data, OpenStreetMap is a prominent community-led effort, where volunteers and paid surveyors contribute maps of the urban environment with granular information about sidewalks, curbs, curb cuts, crossings, obstacles, inclines, building entrances, etc. OpenStreetMap supports entering rail and bus stop data, including the presence of shelters, signage, seating, etc. For the Atlanta region, most of those data points in addition to bus stop census surveys will need to be imported in OpenStreetMap. Generally, data available from OpenStreetMap can greatly help people using mobility devices to plan travel, and knowledge of available bus stop amenities would enhance their travel expectations.

Another standard that could accommodate accessibility and bus stop amenity data is GTFS-pathways,<sup>52</sup> which is an extension of the GTFS standard. GTFS-pathways currently handles transit station amenities such as escalators, elevators, restrooms, wayfinding to entrances/platforms, etc. Extensions for bus stop amenity information are under consideration and could be included in the standard in the future. GTFS-pathways could let the community collect and maintain data on bus stops to complement the existing open sidewalk data in OpenStreetMap.<sup>53</sup>

The USDOT's ITS4US Complete Trip initiative is leading the process to research and improve standards<sup>54</sup> that would let trip planning software provide enhanced directions to people with disabilities. The Atlanta Regional Commission received a grant under this initiative to research accessible routing in Gwinnett County.<sup>55</sup>





## Community Engagement

MARTA Army firmly believes that local residents who live near or use bus stops that have accessibility, safety, or other issues, are best equipped to resolve them. These residents must be empowered to take stewardship of bus stops through cooperative “Adopt-A-Stop” improvement/maintenance programs, leadership training, and education.

### Enhance and expand Adopt-A-Stop programs

Upkeeping over 9,000 bus stops in the MARTA service area is challenging. Construction, severe weather, traffic accidents, vandalism, and normal wear and tear can significantly degrade the experience, even at good bus stops. Without effective channels to collect feedback and data on bus stop conditions, MARTA and its partners in city and county public works departments cannot detect and address problems at bus stops in a timely manner. Luckily, they can alleviate this struggle by entrusting the stewardship of bus stops to everyday people who “Adopt-A-Stop.”

“Adopt-A-Stop” programs are partnerships between residents who live near bus stops and the responsible transit agency and jurisdiction. Residents apply to adopt a bus stop, committing to be its steward. Adopters keep an eye on their bus stops, removing litter and reporting any issues at the stop to the responsible entities. In exchange, the responsible entities conduct training, provide necessary supplies, and distribute small incentives for the program participants.

An example of an Adopt-A-Stop program is the one in effect for the [Mass Transit District \(MTD\)](#) bus system in Champaign-Urbana, IL. The MTD program provides adopters a one-time Monthly Pass and cleaning supplies in exchange for cleaning the shelter windows, picking/sweeping up litter, ensuring up-to-date information is posted at the shelter, and notifying MTD of any damage, vandalism, or unsafe condition at the stop.<sup>56</sup> Similar programs have been adopted by transit systems in Seattle, Ann Arbor, San Jose, Arlington County Virginia, Charleston, Fort Worth, and more.

Adopt-A-Stop programs are already active in DeKalb County<sup>57</sup> and the City of Atlanta<sup>58</sup> and other informal community beautification efforts underway in neighborhoods such as South River Gardens. These

programs are worthwhile and beneficial as frequent users keep an eye on things and note day-to-day problems, reducing the maintenance workload on MARTA while providing boots on the ground to help conduct field work when necessary.

MARTA and local jurisdictions should look to enhance and expand upon the current Adopt-A-Stop programs in effect. Adopt-A-Stop programs should have good incentives, such as monthly transit passes, to make it worthwhile to sponsors, and sufficient oversight to ensure the program is providing value to MARTA and local partners. When properly administered, Adopt-A-Stop programs are a low-cost and effective approach for empowering local communities to make MARTA's bus stops safer, cleaner, and more accessible.

### Host Resident Leader Academies for Bus Stops

Community organizations and local jurisdictions can also play a role in engaging residents by hosting Resident Leader Academies (RLA). RLAs train residents who want to learn how to improve their community. The bus stop RLA should allow residents to educate decision-makers on the ways their bus stops are not meeting their needs. The bus stop RLA should also equip residents to advocate for their bus stops. This should include a curriculum focused on teaching where responsibilities fall for bus stop planning, design, installation, and maintenance; what safe, accessible, and dignified bus stops look like; how to engage with the community to understand their needs; and how to communicate those needs to decision makers.

PSE provides an excellent example of RLAs in practice. In 2021, PSE launched the Development Watch Academy focused on “educating local residents on the commercial development process, the politics and finance behind commercial development, the history of development and land use in Atlanta, and how to

## Community Engagement

engage and intervene in the development process.”<sup>59</sup> This style of program can be adapted to focus on the issues communities face regarding bus stops.

Bus stop RLAs should be implemented where the need is the greatest, such as along High Injury Network streets or where there is a high concentration of low-grade bus stops. Bus Stop RLAs should also be implemented in tandem with Adopt-A-Stop programs to empower the adopters to address challenging problems related to their bus stops.

**Figure 44** | In addition to the Development Watch Academy, PSE has hosted mobility focused leadership academies, including the 2019 TransFormation Youth Academy cohort pictured above. The academy was hosted in partnership with MARTA and TransFormation Alliance.



### Get Educated on Bus Stops

Underlying MARTA's poor bus stop conditions is a lack of education on their importance and what makes a bus stop safe, accessible, and dignified. The fact that bus stops are overlooked by the eyes of city, state, and county leaders and local residents, including the lack of coverage in the news (compared to rail or futuristic travel modes) is in itself inequity.

With this report, we hope to educate the public about the importance of bus stops as gateways to opportunity and to raise awareness of current conditions and the much needed improvements at bus stops. In addition, we encourage all readers of this report to take their bus stop education a step further by checking out the following resources:

- [Better Buses, Better Cities: How to Plan, Run, and Win the Fight for Effective Transit, Steven Higashide](#)

- [From Sorry to Superb: Everything You Need to Know about Great Bus Stops, TransitCenter](#)
- [MARTA Service Standards FY2022, MARTA](#)
- [Opportunity Deferred: Race, Transportation, and the Future of Metropolitan Atlanta, 2017, Partnership for Southern Equity](#)
- [2019 Regional On-Board Transit Survey, Atlanta Regional Commission](#)
- [Safer Streets 2018, City of Atlanta](#)
- [Safe Routes to Transit: Toolkits for Safe Crossings in Metro Atlanta, 2014, PEDS](#)
- [Toolkit for the Assessment of Bus Stop Accessibility and Safety, National Aging and Disability Transportation Center](#)

### Perform a community bus stop census

Community bus stop censuses are important for prioritizing improvements for bus stops and subsequently allocating funds for their maintenance. Regular bus stop censuses (conducted every five years) allow communities to identify and track changes over time. A census is also a great opportunity for residents to get informed and involved in their neighborhood while creating a sense of ownership among the community.

The Bus Stop Census should include input from people of all ages, genders, ethnicities, and abilities who frequent the bus stops surveyed. A census effort can be as simple as printing out the Bus Stop Census survey (Appendix A) and walking around to each bus stop to answer the questions or a thorough inventory that follows the Comprehensive Bus Stop Checklist from the National Aging and Disability Transportation Center.<sup>60</sup> Communities in need of help can contact MARTA Army through at [www.martaarmy.org](http://www.martaarmy.org), to schedule a Bus Stop Census event in their neighborhood. Ultimately, the goal is to understand the state of bus stops, so that communities can come to a unified vision for what they want and need from their bus stops.



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# Conclusion

**Beneath the findings of this report are everyday people who rely on bus stops for their daily travels. Below are just a few of their submitted stories that highlight the diverse population of bus stop users and the common hardships they face:**

“Lots of veterans use this bus stop since it is across the street from the VA clinic. There should be seating with a shelter since it serves veterans.”

“This bus stop is MISERABLE during the summer months. There’s no shade and no seating, nothing but hot concrete. Conditions affect a lot of riders, too – a lot of construction workers use this stop in the afternoon.”

“There is no sidewalk, and the area around the stop is a grassy hill. When I was pregnant I would have to stand in the road because I was afraid of slipping on the hill.”

The stories above and the contents of this report are indicative of a region-wide struggle to provide safe, accessible, and dignified mobility to its residents through well-planned, well-designed, and well-built bus stops.

Bus stops in metropolitan Atlanta generally have gaps in sidewalk and crosswalk coverage, lack cleanliness and accessible wayfinding information, and are on roads with dangerous speeds.

The deficiencies reported are not solely the responsibility of any one entity. MARTA, state and local jurisdictions, neighborhood associations, churches, community organizations, and individuals have all contributed to the forsaking of bus stops through the prioritization of auto-centric projects, the devaluation of the voices of bus riders, and the inability to think big in small ways. In a region where promises for mobility

have fallen short, it is time to master the basics and regain trust.

Refocusing planning and design efforts to prioritize the needs of bus riders, implementing innovative data sharing and collection practices to gather feedback and monitor bus stop conditions, and empowering communities to take action to understand and improve their bus stops will help promote trust and provide safe, accessible, and dignified bus stops.

Every gateway has its gatekeepers. As gateways to opportunity, bus stops are no different. The responsibility is ours to ensure the gate is flung wide for all to enter.

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# Afterword

**Since the end of data collection, several major developments to the MARTA bus network and local street design have come to light.**

## **First**

Amenities continue to be installed at various bus stops throughout the MARTA service area as part of a pre-pandemic commitment from MARTA to add shelters, benches, and other amenities to 1,000 bus stops at high ridership locations over the course of 5 years. At the time of this writing, MARTA has installed over 195 shelters since 2020. MARTA will also start deploying the new regional design for bus stop signage that includes route numbers and destination, and an ADA information panel at every stop.

## **Second**

MARTA announced plans to embark on a bus network redesign starting in the fall of 2021. The bus network redesign will shift the bus network either to increase coverage to more streets or increase the number of riders by reducing the waiting time between buses on a smaller number of streets. Existing bus routes are likely to change paths and bus stops may be consolidated to speed up service.

## **Third**

The Atlanta Department of Transportation has acknowledged the sidewalk gap in the City of Atlanta and has prepared a methodology for prioritizing sidewalk projects to begin filling this gap.

**Though not an exhaustive list, these examples offer a glimmer of hope for the state of bus stops in metropolitan Atlanta. The process of developing safe, accessible, and dignified bus stops will not happen overnight. But each step taken is one step closer to this goal. The MARTA Army urge transit agencies professionals, local government staff, advocates, and riders to push for that next step, no matter how small it may be.**

# Appendix

- Appendix A**    **Online Survey Form**
- Appendix B**    **Illustrative Example Costs of Bus Stop Amenities**
- Appendix C**    **Number of Bus Stops Surveyed by Route**
- Appendix D**    **Data Cleaning Summary**
- Appendix E**    **Jurisdiction Tables**
- Appendix F**    **Bus Stop Census Individual Grade Maps**
- Appendix G**    **Description of Design Options for Safe Crossings**
- Appendix H**    **Bus Stop Census 2020 Photos**
- Appendix I**    **References**



# Appendix A – Online Survey Form

## Operation Bus Stop Census

Stop ID (required)

213616

What is your email address? A valid email address is required in order to receive prizes.

What street or road is the bus stop located on?

COVINGTON HWY

What is the nearest cross street or landmark?

3408

What routes serve this bus stop?

115

Which direction is the bus heading from this stop?

- Northbound  Southbound  Eastbound  Westbound  
 I don't know

Does the stop have a bench or other seating?

- Yes, there is seating provided by MARTA or another transit agency  
 Yes, there is seating provided by someone else  No, there is no seating

Does this stop have a shelter?

- Yes  No

Does the bus stop include a trash can?

- Yes  No

Does the bus stop have any of these cleanliness issues?

- Litter at the stop  Graffiti (unauthorized) or tagging on bus stop amenities  
 Overflowing or poorly maintained trash can  Dirty seating area  Other

If you had to flag the bus down, would you have to step into the roadway or lean into traffic?

- Yes  No

What wayfinding information is present at the stop? Select all that apply. (required)

- Route Numbers  Route Schedule  Route Map  
 Customer Service Information  None of the Above

Is the wayfinding information located at the eye level of a person using a wheelchair?

- Yes  No  No wayfinding information present

Is the stop well lit at night?

- Yes  No  I don't know

Is there a paved sidewalk to the boarding area of the bus?

- Yes, in both directions  Yes, in only one direction  No

Are there any obstacles at or on the path to this bus stop that would limit the mobility of a person using a wheelchair or stroller?

- Yes  No

If there are obstacles on the path, please briefly describe them.

What is the surface of the boarding area made of?

- Concrete sidewalk  Grass or dirt  Asphalt  Gravel  
 Brick pavers

Is there a clearly marked crosswalk within 100 feet of the stop? Select all that apply. (required)

- Yes, on the main street  Yes, on the cross street  
 Yes, and crosswalk paint is faded or worn away  
 No, no painted crosswalk within 100 feet

What features does the crosswalk(s) have? Select all that apply.

- Traffic light  Curb cuts for wheelchairs  
 Crosswalk signals with push buttons  
 Crossing audio overlays for the visually impaired  
 Tactile guide strips for the visually impaired

Have you observed any of the following unsafe behavior at this stop? Select all that apply. (required)

- Pedestrians using informal pathways where sidewalks do not exist
- Pedestrians competing for seating at the bus stop
- Pedestrians crossing the roadway at midblock locations
- Pedestrians running across roadways to catch the bus
- Dangerous motorist behavior around bus stop (i.e. speeding or not yielding to pedestrians)
- None of the above (first visit to this stop)
- None of the above (occasional or frequent user of this stop)

Did you complete this survey at the physical location of the bus stop?

- Yes  No

Upload a picture of the bus stop. (Max size: 10 Megabytes)

No file chosen

Do you have any additional observations or anecdotes for this bus stop?

This can be used to provide further clarification on questions above or share anecdotes experienced yourself or collected from others.

SUBMIT

## Appendix B - Illustrative Example Costs of Bus Stop Amenities

The table below contains illustrative sample costs, in increasing order, used for estimates in this report. Costs exclude installation and maintenance costs by the applicable entity.

Item	Unit Cost	Source
Trash can	\$200	MARTA Army priced basic trash cans for \$200 each for Operation CleanStop in 2017.
Seating	\$1,200	A Simme seat (simmeseat.com) costs around \$1000 (source: <a href="https://gotriangle.org/news/take-seat-50-transit-stops-getting-benches-thanks-fta-grant">https://gotriangle.org/news/take-seat-50-transit-stops-getting-benches-thanks-fta-grant</a> ).  Other bench models cost \$1000-2000 depending on type, e.g. belson.com.
Curb cut	\$4,000	ATL DOT Update to City Council Feb 2021, <a href="https://citycouncil.atlantaga.gov/Home/ShowDocument?id=5691">https://citycouncil.atlantaga.gov/Home/ShowDocument?id=5691</a>
Crosswalk	\$5,000	Space Coast Area transit stop accessibility study, <a href="https://www.spacecoasttpo.com/home/showpublisheddocument/890/637623882743910940">https://www.spacecoasttpo.com/home/showpublisheddocument/890/637623882743910940</a>  <a href="https://www.district2atlanta.com/downtown-decides">https://www.district2atlanta.com/downtown-decides</a> retrieved April 2021
Shelter	\$15,000	<a href="https://transitcenter.org/publication/sorry-to-superb/">https://transitcenter.org/publication/sorry-to-superb/</a>
Sidewalk	\$1M/mi \$50,000 for 1/20 mi (~270ft)	ATL DOT Update to City Council Feb 2021, <a href="https://citycouncil.atlantaga.gov/Home/ShowDocument?id=5691">https://citycouncil.atlantaga.gov/Home/ShowDocument?id=5691</a>
Traffic light	\$200,000	Renew Atlanta Budget Book Feb 2021 <a href="https://renewatlanta.s3.amazonaws.com/documents/2021.02-Budget-Book.pdf">https://renewatlanta.s3.amazonaws.com/documents/2021.02-Budget-Book.pdf</a> , page 11 line item 1052

## Appendix C - Number of Bus Stops Surveyed by Route

Route Number	Route Name	Total Route Bus Stops	Total Route Bus Stops Surveyed	Percent of Total Surveyed
1	Marietta Blvd/Joseph E Lowery Blvd	73	14	19%
2	Ponce de Leon Avenue / Druid Hills	54	46	85%
3	Martin Luther King Jr Dr/Auburn Ave	95	22	23%
4	Moreland Avenue	109	101	93%
5	Piedmont Road / Sandy Springs	110	102	93%
6	Clifton Road / Emory	125	63	50%
8	North Druid Hills Road	133	10	8%
9	Boulevard / Tilson Road	113	24	21%
12	Howell Mill Road / Cumberland	98	37	38%
14	14th Street / Blandtown	66	27	41%
15	Candler Road	170	108	64%
19	Clairmont Road / West Howard Avenue	129	61	47%
21	Memorial Drive	132	103	78%
24	McAfee / Hosea Williams	203	64	32%
25	Peachtree Industrial Boulevard	50	3	6%
26	Marietta Street / Perry Boulevard	101	79	78%
27	Cheshire Bridge Road	68	24	35%
30	LaVista Road	112	10	9%
32	Bouldercrest	130	38	29%
34	Gresham Road	129	27	21%

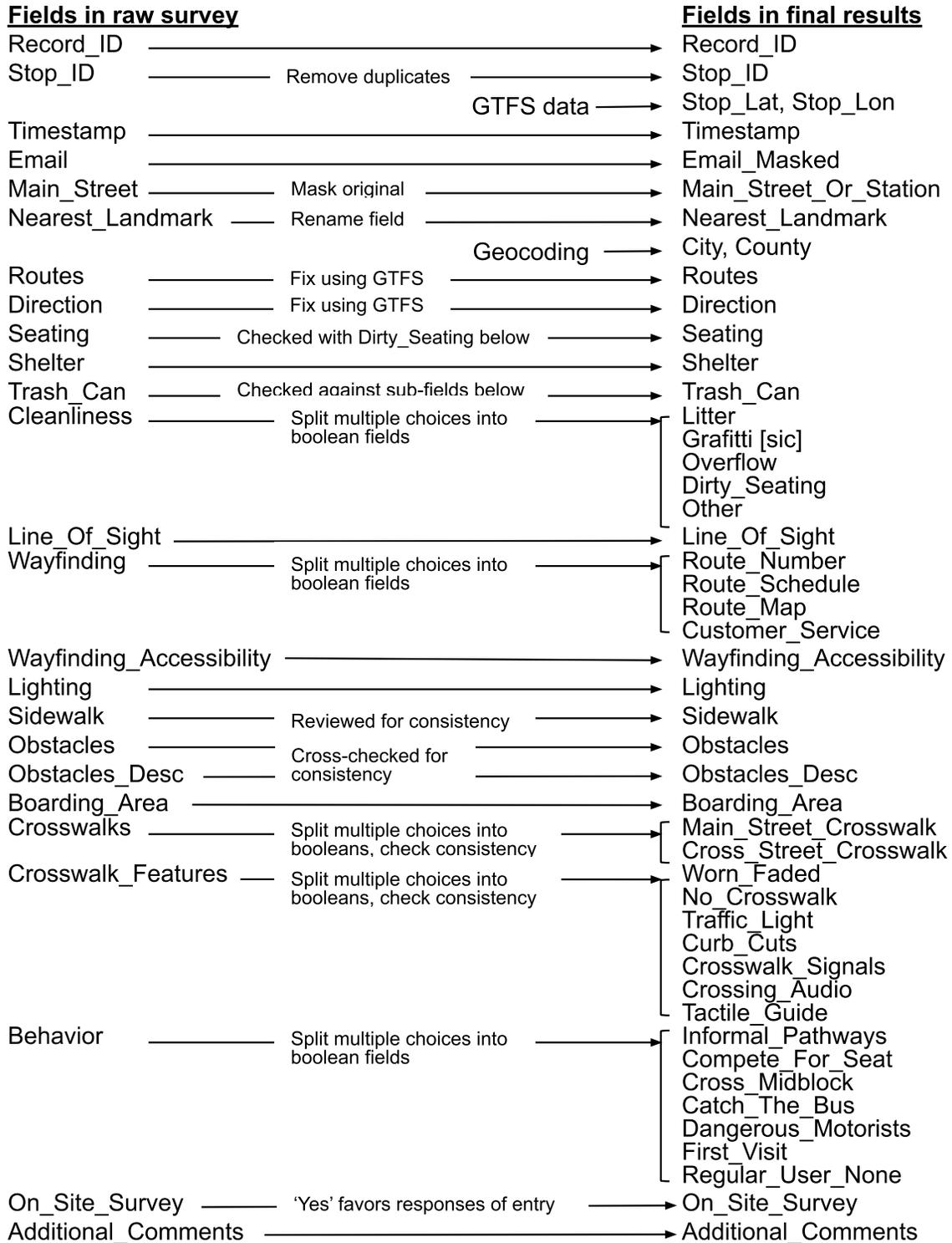
Route Number	Route Name	Total Route Bus Stops	Total Route Bus Stops Surveyed	Percent of Total Surveyed
36	N Decatur Road / Virginia Highland	134	55	41%
37	Defoors Ferry Road	66	25	38%
39	Buford Highway	88	83	94%
40	Peachtree Street / Downtown	85	63	74%
42	Pryor Road	113	38	34%
47	I-85 Access Road / Briarwood Road	92	2	2%
49	McDonough Boulevard	120	58	48%
50	Donald Lee Hollowell Parkway	114	47	41%
51	Joseph E Boone Boulevard	100	92	92%
55	Jonesboro Road	154	105	68%
58	Hollywood Road / Lucile Avenue	143	18	13%
60	Hightower Road	87	46	53%
66	Lynhurst Drive / Princeton Lakes	160	86	54%
68	Benjamin E Mays Drive	156	30	19%
71	Cascade Road	89	87	98%
73	Fulton Industrial	113	112	99%
74	Flat Shoals Road	112	44	39%
75	Lawrenceville Highway	99	7	7%
78	Cleveland Ave	55	54	98%
79	Sylvan Hills	94	20	21%
81	Venetian Hills / Delowe Drive	159	30	19%
82	Camp Creek / South Fulton Parkway	82	24	29%
83	Campbellton Road	80	71	89%

Route Number	Route Name	Total Route Bus Stops	Total Route Bus Stops Surveyed	Percent of Total Surveyed
84	Washington Rd/Camp Crk Marketplace	86	44	51%
85	Roswell	83	5	6%
86	Fairington Road	154	147	95%
87	Roswell Road / Morgan Falls	102	34	33%
89	Old National Highway	118	84	71%
93	Headland Drive / Main Street	84	22	26%
94	Northside Drive	51	25	49%
95	Metropolitan Parkway	111	33	30%
102	North Avenue / Little Five Points	56	53	95%
103	Peeler Road	80	2	3%
104	Winters Chapel Road	26	0	0%
107	Glenwood	165	67	41%
110	Peachtree Road / Buckhead	104	43	41%
111	Snapfinger Woods	150	62	41%
114	Columbia Drive	110	12	11%
115	Covington Highway	120	27	23%
116	Redan Road	112	71	63%
117	Rockbridge Road / Panola Road	178	88	49%
119	Hairston Road / Stone Mtn Village	93	23	25%
120	East Ponce De Leon Avenue	102	44	43%
121	Memorial Drive / N Hairston Road	126	119	94%
123	Church Street / North DeKalb Mall	50	2	4%
124	Pleasantdale Road	92	18	20%

Route Number	Route Name	Total Route Bus Stops	Total Route Bus Stops Surveyed	Percent of Total Surveyed
125	Clarkston	122	36	30%
126	Chamblee-Tucker Road	115	4	3%
132	Tilly Mill Road	70	12	17%
133	Shallowford Road	55	2	4%
140	North Point Parkway	55	1	2%
141	Haynes Bridge Road / Milton	92	1	1%
142	East Holcomb Bridge Road	26	1	4%
143	Windward Park & Ride	54	1	2%
148	Mount Vernon Highway	40	4	10%
150	Dunwoody Village	60	12	20%
153	James Jackson Parkway	52	13	25%
155	Pittsburgh	119	21	18%
162	Myrtle Drive / Alison Court	48	16	33%
165	Fairburn Road	95	33	35%
172	Sylvan Road / Virginia Avenue	123	34	28%
178	Empire Blvd / Southside Ind Park	68	30	44%
180	Roosevelt Highway	124	48	39%
181	Washington Road / Fairburn	151	63	42%
183	Barge Road P&R / Lakewood	84	24	29%
185	Alpharetta	81	19	23%
186	Rainbow Drive / South DeKalb	82	42	51%
189	Flat Shoals Road / Scofield Road	113	14	12%
191	Riverdale / ATL Intl Terminal	141	58	41%

Route Number	Route Name	Total Route Bus Stops	Total Route Bus Stops Surveyed	Percent of Total Surveyed
192	Old Dixie / Tara Boulevard	108	28	26%
193	Morrow / Jonesboro	172	74	43%
194	Conley Road / Mt Zion	114	2	2%
195	Forest Parkway	95	15	16%
196	Upper Riverdale / Southlake	86	32	37%
201	Six Flags Over Georgia	2	0	0%
221	Memorial Drive Limited	24	13	54%
295	Metropolitan Campus Express	6	2	33%
800	Lovejoy	42	2	5%
809	Monroe Drive / Boulevard	91	27	30%
813	Atlanta University Center	88	31	35%
816	North Highland Avenue	124	77	62%
823	Belvedere	80	13	16%
825	Johnson Ferry Road	34	1	3%
832	Grant Park	76	16	21%
850	Carroll Heights / Fairburn Heights	88	7	8%
853	Center Hill	97	10	10%
856	Baker Hills / Wilson Mill Meadows	84	6	7%
865	Boulder Park Drive	89	0	0%
867	Peyton Forest / Dixie Hills	86	8	9%
899	Old Fourth Ward	56	35	63%

# Appendix D - Data Cleaning Summary



# Appendix E - Jurisdiction Tables

Survey results summarized by MARTA jurisdiction and city/neighborhood can be accessed at the following link: [Bus Stop Census 2020 Summary Results](https://bit.ly/jurisdiction-tables-obsc) or via <https://bit.ly/jurisdiction-tables-obsc>

Document preview:

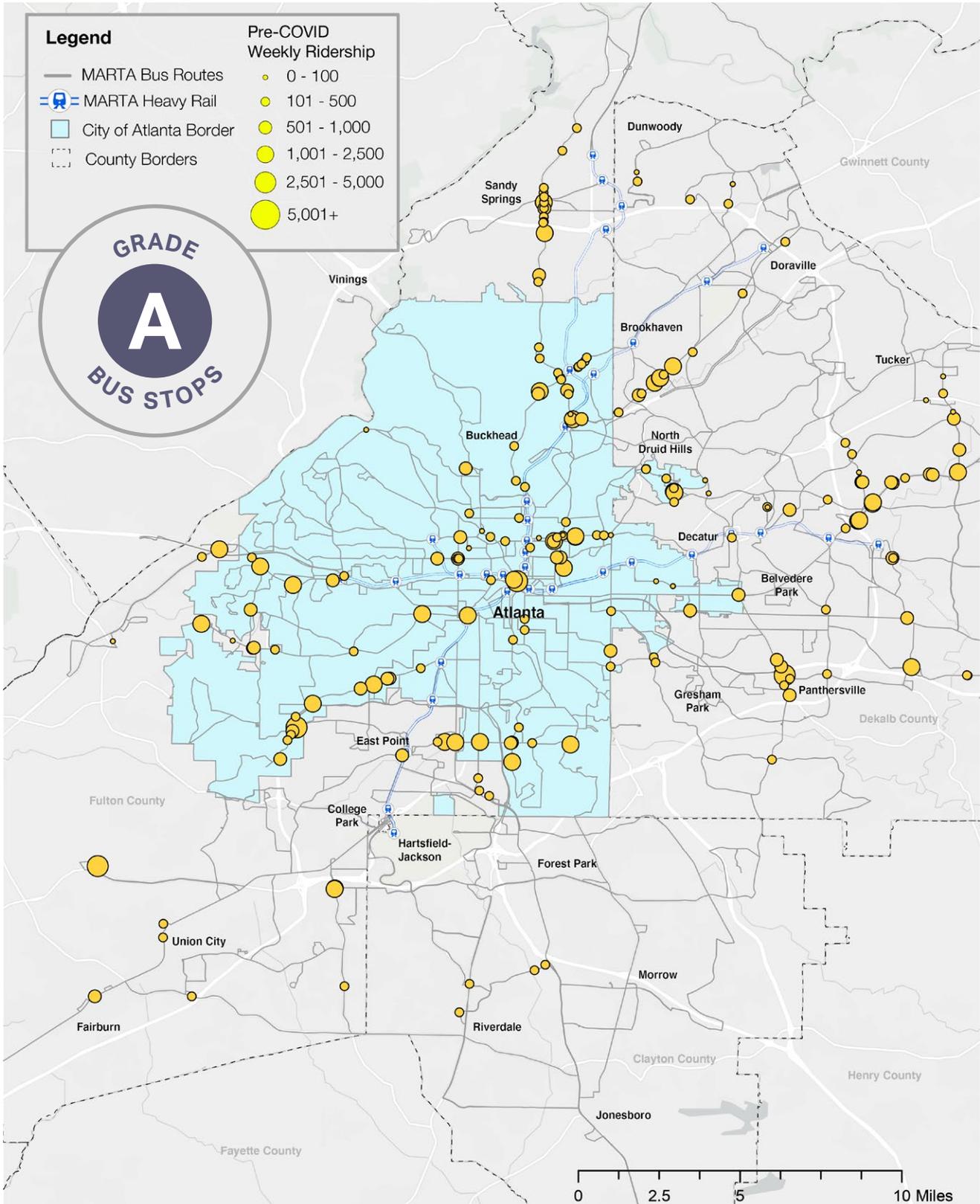
	A	B	C	D	E	F	G	H	I	J	K	L	M
1	Trash_Car Stop_Cou	Cum_Wei	Cum_Wei	Cum_Wei	Cum_Wei	Cum_Wei	Cum_Wei	Cum_Wei	Percent_	Percent_	Percent_	Percent_	Percent_
2	Yes	937	207892.0	160291.4	368183.4	140866.1	111346.1	252212.3	0.29	0.62	0.46	0.54	0.63
3	No	2311	128547.5	185753.8	314301.3	83289.89	119490.6	202780.5	0.71	0.38	0.54	0.46	0.37
4													
5	MARTA_Ji	Trash_Car Stop_Cou	Cum_Wei	Cum_Wei	Cum_Wei	Cum_Wei	Cum_Wei	Cum_Wei	Percent_	Percent_	Percent_	Percent_	Percent_
6	Atlanta	Yes	358	90664.21	71323.44	161987.6	58083.79	46517.61	104601.4	0.21	0.51	0.38	0.44
7	Atlanta	No	1314	88274.68	116098.1	204372.8	55546.83	71943.13	127489.9	0.79	0.49	0.62	0.56
8	Clayton	Yes	100	15784.11	8888.645	24672.75	10754.35	6283.239	17037.59	0.65	0.82	0.78	0.8
9	Clayton	No	55	3561.643	2527.848	6089.491	2085.612	1604.98	3690.592	0.35	0.18	0.22	0.2
10	DeKalb	Yes	279	60097.13	44407.85	104504.9	40876.81	31483.24	72360.06	0.3	0.71	0.53	0.62
11	DeKalb	No	642	24094.29	39756.57	63850.86	15288.02	25547.90	40835.93	0.7	0.29	0.47	0.38
12	Fulton	Yes	198	40340.81	34850.09	75190.91	30295.96	26176.09	56472.06	0.4	0.76	0.56	0.65
13	Fulton	No	299	12524.45	27354.29	39878.74	10324.94	20385.76	30710.70	0.6	0.24	0.44	0.35
14	Other	Yes	2	1005.755	821.386	1827.141	855.256	885.937	1741.193	0.67	0.916	0.98	0.943
15	Other	No	1	92.498	16.939	109.437	44.477	8.882	53.359	0.33	0.084	0.02	0.057
16													
17	City_Neig	Trash_Car Stop_Cou	Cum_Wei	Cum_Wei	Cum_Wei	Cum_Wei	Cum_Wei	Cum_Wei	Percent_	Percent_	Percent_	Percent_	Percent_
18	Alpharett	Yes	1	1532.777	243.45	1776.227	0	0	0	0.14	0.78	0.36	0.67
19	Alpharett	No	6	423.768	440.294	864.062	419.6	358.643	778.243	0.86	0.22	0.64	0.33
20	Atlanta	Yes	358	90664.21	71323.44	161987.6	58083.79	46517.61	104601.4	0.21	0.51	0.38	0.44
21	Atlanta	No	1314	88274.68	116098.1	204372.8	55546.83	71943.13	127489.9	0.79	0.49	0.62	0.56
22	Belvedere	Yes	23	2160.251	2019.401	4179.652	1084.607	1099.316	2183.923	0.37	0.75	0.54	0.63
23	Belvedere	No	39	723.491	1696.759	2420.25	360.581	1142.485	1503.066	0.63	0.25	0.46	0.37
24	Brookhav	Yes	13	7567.448	4003.703	11571.15	4686.558	3000.62	7687.178	0.29	0.62	0.31	0.46
25	Brookhav	No	32	4703.676	8913.774	13617.45	3275.379	5264.382	8539.761	0.71	0.38	0.69	0.54
26	Candler-N	Yes	15	2967.314	2450.132	5417.446	1645.943	1307.815	2953.758	0.29	0.65	0.62	0.64
27	Candler-N	No	37	1591.14	1493.93	3085.07	903.467	952.012	1855.479	0.71	0.35	0.38	0.36
28	Chamblee	Yes	8	1897.636	1490.134	3387.77	1633.818	1151.963	2785.781	0.2	0.43	0.3	0.36
29	Chamblee	No	33	2514.348	3519.004	6033.352	1750.596	2601.786	4352.382	0.8	0.57	0.7	0.64
30	Clarkston	Yes	9	1973.569	759.872	2733.441	1085.653	534.773	1620.426	0.5	0.86	0.49	0.71
31	Clarkston	No	9	310.696	802.649	1113.345	156.33	510.313	666.643	0.5	0.14	0.51	0.29
32	College P	Yes	8	2919.097	2968.306	5887.403	2675.722	2691.983	5367.705	0.22	0.76	0.64	0.7
33	College P	No	28	925.225	1645.021	2570.246	562.991	1090.339	1653.33	0.78	0.24	0.36	0.3
34	Conley	Yes	1	48.273	4.655	52.928	0	0	0	1	1	1	1
35	Decatur	Yes	3	268.975	39.933	308.908	177.61	20.369	197.979	0.051	0.35	0.027	0.14
36	Decatur	No	56	508.891	1464.8	1973.691	256.74	649.048	905.788	0.949	0.65	0.973	0.86
37	Doraville	Yes	8	588.445	546.626	1135.071	397.066	405.705	802.771	0.33	0.34	0.3	0.32
38	Doraville	No	16	1118.49	1248.315	2366.805	594.15	902.786	1496.936	0.67	0.66	0.7	0.68
39	Druid Hill	Yes	5	632.714	528.389	1161.103	151.428	137.869	289.297	0.13	0.64	0.54	0.59
40	Druid Hill	No	33	349.529	450.043	799.572	50.825	83.403	134.228	0.87	0.36	0.46	0.41
41	Dunwood	Yes	6	699.705	590.727	1290.432	0	0	0	0.32	0.922	0.6	0.74
42	Dunwood	No	13	59.038	394.229	453.267	0	57.688	57.688	0.68	0.078	0.4	0.26
43	East Point	Yes	46	9978.269	11902.18	21880.45	6534.526	6588.914	13123.44	0.4	0.84	0.65	0.73
44	East Point	No	68	1858.632	6398.559	8257.191	1330.528	3820.883	5151.411	0.6	0.16	0.35	0.27
45	Fairburn	Yes	1	584.682	80.831	665.513	172.404	13.748	186.152	0.11	0.45	0.07	0.27
46	Fairburn	No	8	728.743	1068.636	1797.379	164.871	338.106	502.977	0.89	0.55	0.93	0.73
47	Forest Pai	Yes	14	1876.109	798.832	2674.941	1274.342	560.832	1835.174	0.933	1	1	1
48	Forest Pai	No	1	0	0	0	0	0	0	0.067	0	0	0
49	Gresham	Yes	1	41.295	62.722	104.017	0	0	0	0.25	0.22	0.41	0.31
50	Gresham	No	3	143.633	90.88	234.513	0	0	0	0.75	0.78	0.59	0.69
51	Hapeville	Yes	17	1740.981	665.071	2406.052	1208.917	458.415	1667.332	0.57	0.83	0.39	0.63

Boarding and Alighting Summary Survey Statistics Seating Shelter Trash Can

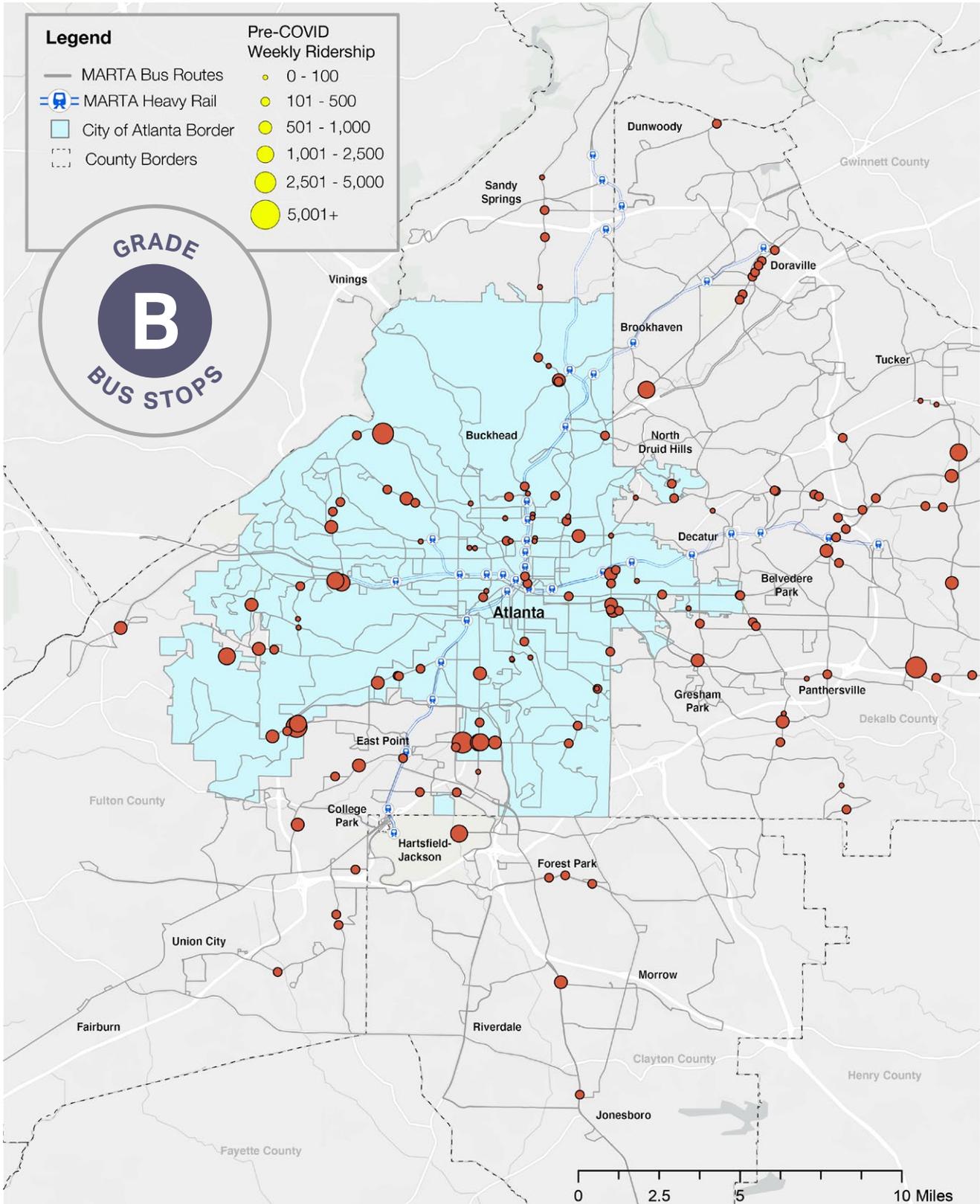
# Appendix F - Bus Stop Census Individual Grade Maps

The following figures show the locations of bus stops for each grade determined by the Bus Stop Census Report Card.

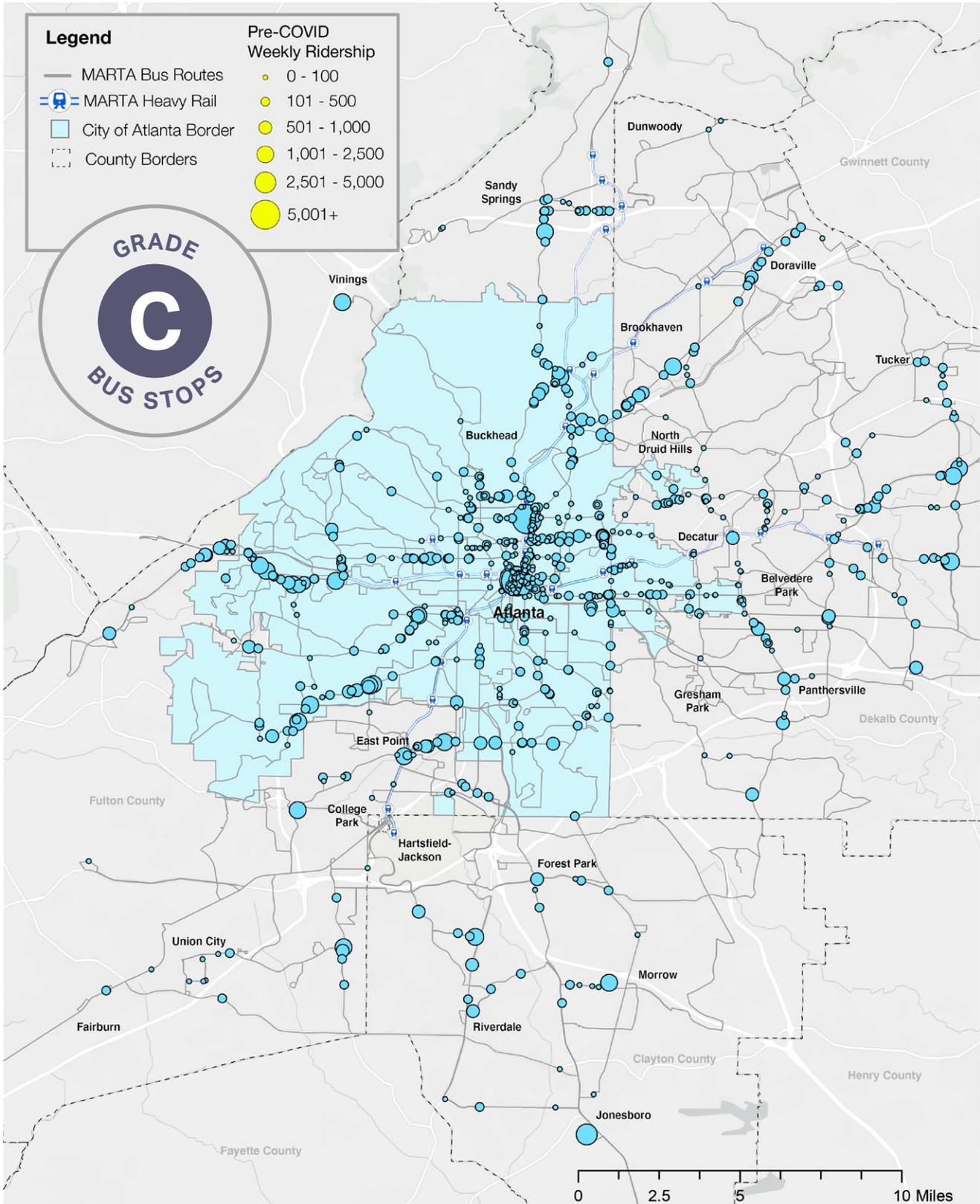
Map of bus stops with an A Grade



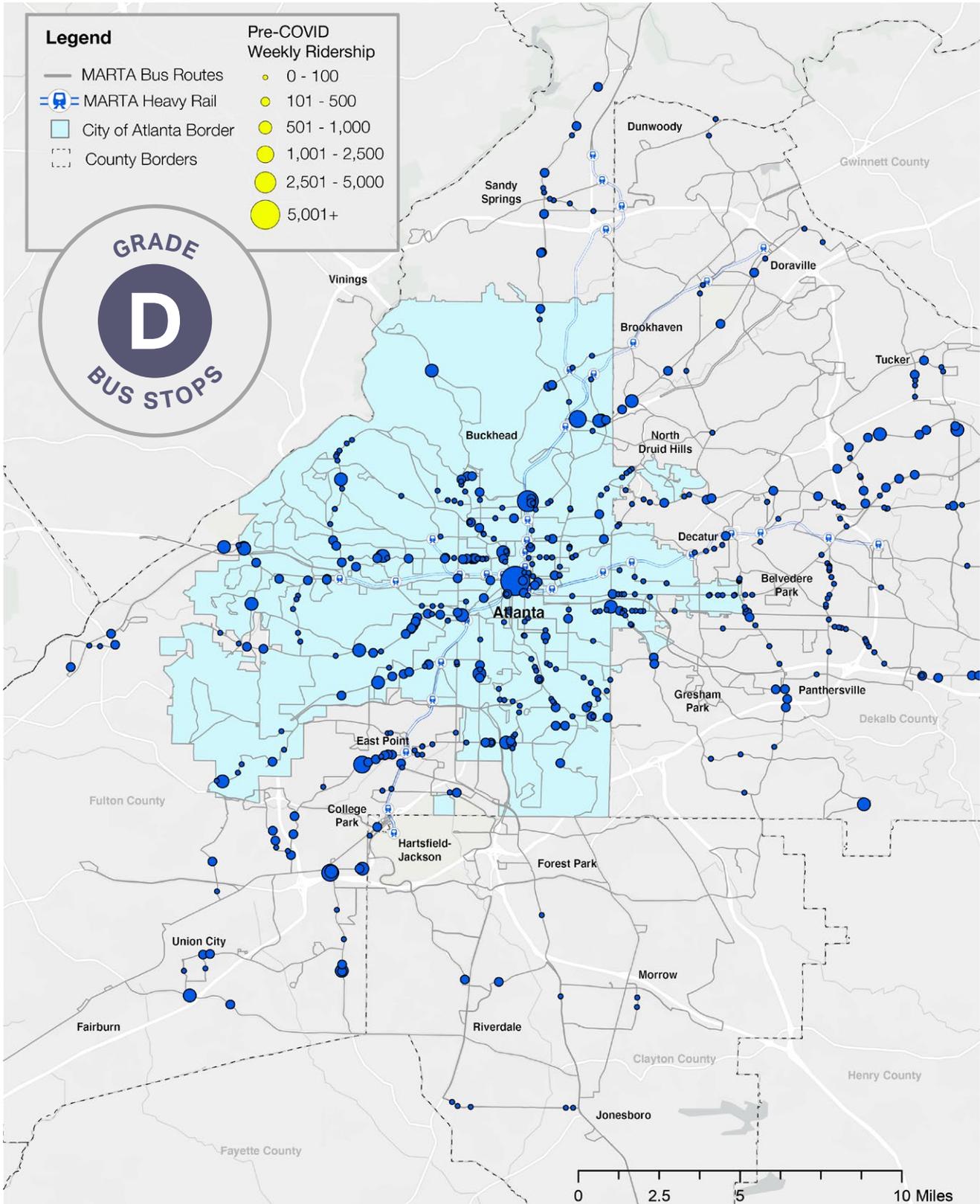
Map of bus stops with a B Grade



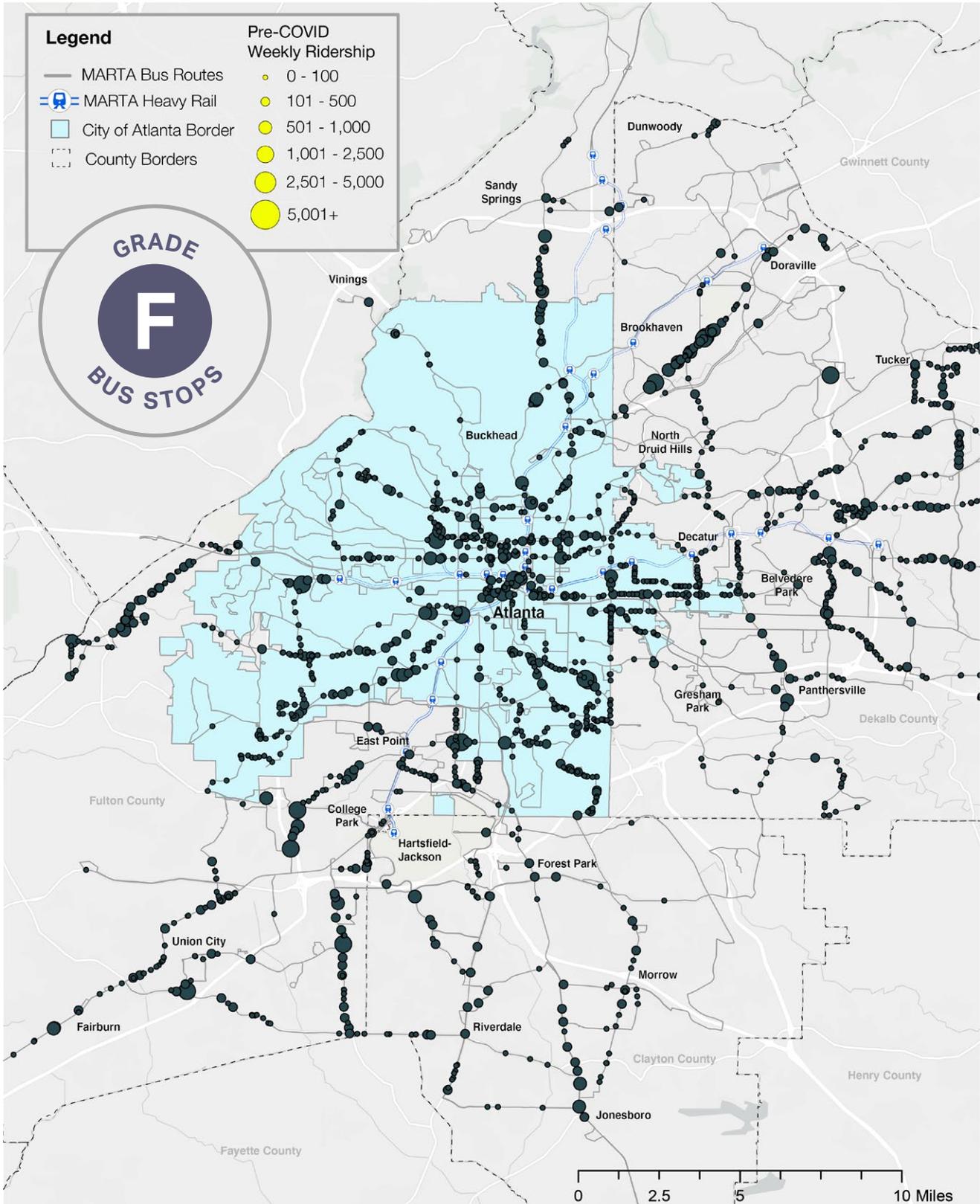
Map of bus stops with a C Grade



Map of bus stops with a D Grade



Map of bus stops with an F Grade



# Appendix G - Description of Design Options for Safe Crossings

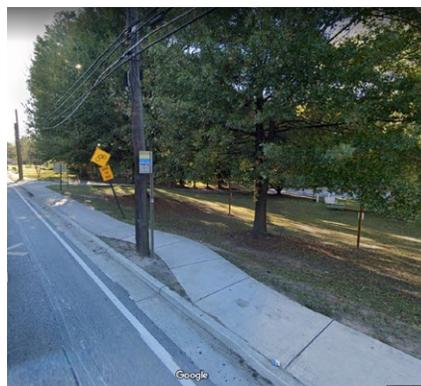
The following descriptions of safe crossing designs are excerpts from the PEDS' 2014 report, "Safe Routes To Transit - Toolkits for Safe Crossing in Metro Atlanta". MARTA Army encourages the reader to reference this report for its recommendations on creating safe crossings for transit access.

## Safe Crossing Design Options

- **Marked crosswalks** facilitate crossings at many locations that aren't controlled by traffic signals. Yet research shows that marked crosswalks on their own are insufficient on multi-lane streets with high traffic speeds or volumes. In most cases they should be used in combination with other treatments, such as raised islands, lighting, and signage.
- **Medians and median islands** are a top safety countermeasure and can be built prior to installing crosswalks or other treatments. They're also a cost-effective solution at locations where red-light treatments are inappropriate. When used without marked crosswalks, median islands are not intended to cause drivers to stop. Instead, they provide a safe refuge so pedestrians can split crossings into two stages, with a safe place to wait in between. Research shows that medians and median islands reduce pedestrian crashes by 39 percent at locations without crosswalks and 46% at locations with marked crosswalks.
- **High-visibility signage**, including overhead regulatory signs and in-street crosswalk signs, are more effective than the diamond-shaped warning signs that have been used for decades. At locations on two-lane roads with in-street crosswalk signs, 87 percent of drivers stop or yield for pedestrians. In-street signs are appropriate on streets with a speed limit of 30 mph or less.
- **Overhead lighting** is a cost-effective treatment in locations where other options are limited. Research shows that overhead lighting at intersections reduces fatal pedestrian-vehicle crashes by 80 percent. It also reduces other pedestrian-injuring crashes by 59 percent.
- **Rectangular Rapid Flash Beacons**, which use LEDs with a "stutter-flash", increase driver compliance dramatically. Research found that four out of five drivers stop at crosswalks equipped with RRFBs. RRFBs are especially appropriate on streets with speed limits of 30 or less where pedestrian volumes are too low to warrant a red-light treatment.
- **Red-light treatments** use traffic signals or Pedestrian Hybrid Beacons (PHBs) (aka HAWKs) to get drivers to stop before pedestrians get a walk signal. These are usually the safest treatments for high-speed roads or ones with high-traffic volumes. Unfortunately, the [Manual of Uniform Traffic Control Devices](#), which regulates where these can be used, prevents red light treatments from being used at the majority of the most dangerous bus stops. MUTCD states that traffic signals aren't warranted unless at least 93 large pedestrians cross the street at the location during at least one hour a day. For PHBs, the minimum is 20 pedestrians during at least a single hour.
- **Leading Pedestrian Intervals** give pedestrians a head start at signalized intersections. These are cost-free improvements that increase safety for people crossing at signalized intersections.

# Appendix H - Bus Stop Census 2020 Photos

Hundreds of photos of bus stops were collected as part of Bus Stop Census 2020. These photos may be found on [MARTA Army's Flickr page](#).



# Appendix I - References

## Section 1

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# Glossary

<b>ADA</b>	Americans with Disabilities Act
<b>APTA</b>	American Public Transportation Association
<b>ARMPC</b>	Atlanta Regional Metropolitan Planning Commission
<b>ASCE</b>	American Society of Civil Engineers
<b>ATL ("The ATL")</b>	Atlanta-Region Transit Link Authority
<b>ATLDOT</b>	see <i>DOT</i>
<b>Arterial road</b>	see Highway
<b>Boarding area</b>	The space between the curb and the sidewalk that passengers must traverse in order to board the bus. It is also the surface on which the accessibility ramp of the bus would land when deployed.
<b>CID</b>	Community Improvement District – A district in which members agree to tax themselves to fund improvements to the public space in their area
<b>Collector road</b>	A road that connects smaller streets to highways. Examples of collector roads in Atlanta include (North) Highland Avenue, Cascade Avenue
<b>Cross Street</b>	Street that runs perpendicular or “crosses” the main street. See <i>Main Street</i> .
<b>DOT</b>	Department of Transportation. Can be city (e.g. ATLDOT), county, state, or federal.
<b>FHWA</b>	Federal Highway Administration
<b>FTA</b>	Federal Transit Administration
<b>GTFS</b>	General Transit Feed Specification, a standard used by mainstream map and navigation applications that describes different aspects of a transit service, such as the locations of transit routes and stops, departure and arrival times at each stop, and also the real-time position of transit vehicles (and whether they are on time, early, or late) and real-time service alerts.
<b>Highway</b>	A large road, with multiple lanes in each direction, meant for fast vehicular travel within or between cities. Examples of highways in Atlanta include Peachtree Road, Buford Highway and Metropolitan Parkway.

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<b>OpenStreetMap</b>	An open database maintained by the community, containing detailed information about streets, roads, and trails, including position and layout.
<b>Main Street</b>	For the purposes of this report, the street on which the bus is traveling as it picks up or drops off passengers at a surveyed stop** or ** on which a surveyed bus stop is located.
<b>MARTA</b>	Metropolitan Atlanta Rapid Transit Authority
<b>MTD</b>	Champaign-Urbana Mass Transit District (Illinois)
<b>MUTCD</b>	Manual of Uniform Traffic Control Devices
<b>NPU</b>	Neighborhood Planning Unit - An open citizen council set up for a portion of the City of Atlanta, that is responsible for reviewing future construction plans and land use policies in their area. There are 25 NPUs in Atlanta.
<b>SPLOST</b>	Special-Purpose Local Option Sales Tax
<b>Tactile Guide Strips</b>	Textured ground surface that helps to guide visually impaired people in a space.
<b>T-SPLOST</b>	A transportation SPLOST.
<b>Universal Design</b>	The design and composition of an environment so that it can be accessed, understood and used to the greatest extent possible by all people regardless of their age, size, ability or disability.
<b>Wayfinding Information</b>	Visual or tactile systems that guide people through a physical environment and enhance their understanding and experience of the space.

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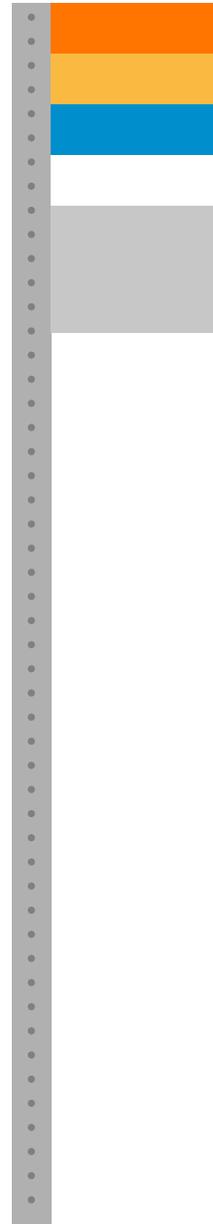
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# About MARTA Army

We empower local residents throughout the Atlanta Region to improve the transit ridership experience in their own neighborhoods.

The MARTA Army is an independent grassroots action group, committed to enhancing the ridership experience on public transit here in Metro Atlanta. We are a completely crowd-funded organization, and your generous donations help us improve our public transit every day.

We use the collected funds to run MARTA Army Operations across Atlanta. These operations improve the condition of transit in Atlanta in small but significant and visible ways.



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